

Case Report

Twin Reversed Arterial Perfusion (TRAP) Syndrome or acardiac twin: a case report in Madagascar

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ABSTRACT

TRAP syndrome is a rare complication of monochorionic twin pregnancy. It is characterized by the association of an acardiac twin with a healthy twin. The acardiac twin is a parasite who put the healthy twin at high risk of cardiac failure. We report a case in a 25-year-old Malagasy woman, primigravida, who had a consultation at gestational week 31 for significant dyspnea and a threat of premature delivery. Ultrasound scans discovered an acute polyhydramnios, fetus with anasarca and low cardiac activity, and a para-fetal mass. She gives birth to a male newborn and an acardiac twin without head and upper body. The first twin died short time after birth.

Keywords: Acardiac twin, Madagascar, Twin reversed arterial perfusion syndrome, Ultrasound

INTRODUCTION

TRAP syndrome or acardiac twin pregnancy is a very rare complication of monozygotic twins. It occurs only in 1 in 35,000 deliveries and in 1% of monozygotic twins.^{1,2} It is characterized by a presence of a vascular anastomosis between the acardiac and the healthy fetus. The acardiac twin does not have its own heart pump. The heart of the healthy fetus ensures its vascularization (pump twin). The blood flow of the acardiac twin is then reversed.³ We aimed to report one case in Madagascar.

RESULTS

It was a first pregnancy of a Malagasy at 25-year-old woman, who is a saleswoman. It was a spontaneous conception in non-consanguineous marriage. The pregnancy

was considered unique and was followed clinically and biologically until 13 weeks of gestation. She had come to consultation at gestational week 31 for significant dyspnea. The uterine height was 39cm. Her vaginal examination revealed cervical dilation at 4 cm, 70% effaced, vertex applied. Ultrasound scans discovered an acute polyhydramnios, fetus with anasarca and low cardiac activity, and a para-fetal mass evoking a twin acardiac.

The patient, after being fully consulted and informed for poor prognosis of condition of anasarca decided for vaginal birth. Two hours after her admission, she gives birth to a 1200g male newborn that is followed by the expulsion of an 1800g acardiac twin. This sex was not differentiated, and the insertion of the umbilical cord was low (Figure 1). The thighs were large, the legs short and the toes incomplete (Figure 2). Severe subcutaneous

edema and anal imperforation were associated. The first twin died short time after birth.

On examination of the placenta and umbilical cords, the anastomosis was not visible.



Figure 1: Front view of the acardiac twin.



Figure 2: Posterior view of the acardiac twin.

DISCUSSION

TRAP syndrome or acardiac twin is exclusively associated with monochorionic twin pregnancies.⁴ The physiopathology of this complication is uncertain. The presence of placenta vascular anastomosis is common in monochorionic twins and alone it is not enough to develop TRAP syndrome.⁵ It could be observed when the low oxygen and low nutrient blood from the normal fetus (pump twin), instead of going back to the placenta passed directly through an anastomosis to the umbilical artery or in the systemic blood flow of the acardiac twin. It is creating a reversed arterial perfusion. Generally the anastomosis is arterio-arterial, but veno-venous and arteriovenous anastomosis could appear.⁵ This arterio-arterial anastomosis can be located either on the surface of the placenta or in the placental arterial system, or more rarely as a direct connection of the fetal umbilical cords.⁶ Nigam A et al hypothesized that compression of the cephalic pole of the embryo inhibiting curving and fusion

of the primitive heart tube is the basic cause resulting in non-formation of the heart and other organs.⁴

Acardiac twin can be classified in four types: acephalic (without head), aniceps (with some cranial structures and / or nervous tissue), acornus (with head but without trunk) and amorphous (without head and upper body).² This last type was observed in the case that we report and it is observed in the most cases in literature.³

TRAP syndrome could have heavy circulation consequences in the healthy fetus. This can go up to the development of cardiac insufficiency, polyhydramnios, and consequently heart failure. The mortality rate of the pump twin is high, it is more than 50%.^{6,7} In the case that we report, the condition of anasarca is a sign of advanced heart failure.

Concerning the diagnostic means, acardiac twin can be detected on ultrasound at gestational age of 13 weeks.⁵ An holoprosencephaly, an anencephaly, lack of facial mass, anophthalmia, cleft palate, absent or rudimentary limbs, diaphragmatic or esophagus atresia, absence of thorax and heart, absence of liver and gallbladder, subcutaneous edema and single umbilical artery in one of the twins must evoke an acardiac twin.² Early diagnosis would allow active management. Currently, the possibility of treatment is pregnancy termination, expectant management, intrafetal ablation, or interventional anastomosis sclerotization using alcohol ablation, thermal ablation, laser ablation, bipolar coagulation or histoacryl to occlude the circulation of the acardiac twin and interrupt the TRAP sequence.^{1,3,8} None of these techniques is available in Madagascar. If TRAP syndrome was diagnosed early in the case that we report, expectant management and regular ultrasound examination and cardiotocographic monitoring would have been performed to allow fetal extraction by cesarean section as soon as signs of heart failure are seen in the normal fetus at a term of fetal viability.

CONCLUSION

Acardiac twin is a parasite. Early diagnosis helps to preserve the healthy twin when different therapeutic means are available. In the opposite case, it makes it possible to plan the surveillance and to extract the fetus in the event of cardiac decompensation.

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