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Case Report

Successful management of pump twin

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ABSTRACT

Acardiac twinning is one of the rare but important complication of monochorionic twin pregnancies leading to increased perinatal mortality of both twins. Since one of the twins did not have well developed cardiac structure it depended on the co-twin for blood supply. This increases mortality of co twin. We reported a case of acardiac twin diagnosed at proper time managed with interstitial laser occlusion of cord at appropriate time with successful outcome of normal co-twin. This case highlighted the importance of early diagnosis, proper timing and selection of vascular occlusion procedure to occlude blood flow to acardiac twin and close surveillance and delivery of donor twin, to improve perinatal outcome.

Keywords: Acardiac twin, TRAP sequence, Pump twin

INTRODUCTION

Acardiac acephalic twin is one of the complications of multiple pregnancies, its incidence being 1 in 35,000 of all pregnancies and 1 in 100 of monochorionic twin pregnancies.[1] In this condition there is a normally developed twin called pump/donor twin and an acardiac twin called recipient twin. Here placental vascular anastomosis of both arterio-arterial and veno-venous shunt are present. The donor twin pumps blood into the acardiac recipient. Since donor twin has to pump blood for itself and the recipient acardiac twin, it develops cardiac failure and mortality rate is high. Early diagnosis, appropriate vascular occlusion technique at the right time and careful surveillance of the donor twin reduces perinatal mortality of normal twin. Here, we reported a case of acardiac acephalic twin with twin reverse arterial perfusion (TRAP) sequence and its outcome.

CASE REPORT

A 24 years old primigravida reported in Preethashree Hospital at 8 weeks of pregnancy and her pregnancy was diagnosed as monochorionic, diamniotic twin pregnancy with one live twin another twin as suspected fetal demise and then was confirmed as acardiac twin in Doppler study. She was then carefully followed up and was referred to Mediscan fetal care centre, Chennai at 24 weeks for vascular occlusion procedure. Realtime ultrasonography done there revealed a monochorionic, diamniotic twin pregnancy. Fetus-A (pump twin) biometry corresponded to an average of 24 weeks 3 days. Estimated fetal weight-676±67 grams. Doppler study was normal. Amniotic fluid index showed hydramnios. Fetus-B (recipient twin) was an acardiac twin with single umbilical artery. Volume was 264 cubic cm. Amniotic fluid index showed anhydramnios. Flow reversal was seen in the umbilical artery and vein. Placenta was anterior, common to both and a separating membrane seen between both fetuses. Thus monochorionic, diamniotic twins with TRAP sequence was confirmed.

The decision of intervention of blood supply occlusion to acardiac twin was taken.

After counselling and getting informed consent from the couple, interstitial laser cord occlusion was done.

Figure 1: Healthy pump twin.

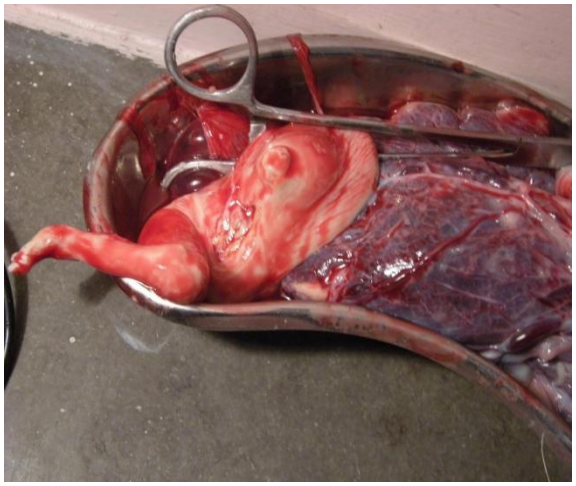

Figure 2: Acardiac twin.

Under intravenous sedation, antibiotic and tocolytic cover with ultrasound (USG) guidance, an 18-gauge spinal needle was introduced into the amniotic cavity and interstitial laser of 30 watts was used to occlude the cord of acardiac twin. Cessation of blood flow to the cord was confirmed. Patient tolerated the procedure well. 24-48 hours post procedure USG was normal.

Patient was followed up carefully at Preethashree Hospital, Tirumangalam. From 32 weeks, weekly Doppler study to monitor the alive fetus and coagulation status of mother was done. By 38th week in Doppler study, middle cerebral artery flow to live twin got reduced and fetal heart rate became variable. Hence, an emergency caesarean section was done by 38 weeks.

An alive term healthy male baby was delivered weighing 2950 grams. Its APGAR was 7/10 and 10/10 at 5 and 10 minutes respectively.

Acardiac twin weighed 250 grams. It had a partially developed trunk with one lower limb fully developed. Head, thorax and upper limbs were not developed which fits into acardiac, acephalic type.

DISCUSSION

Acardiac twin is a rare and unique medical complication of monozygotic twins.[2] Other names are *Holocardius, Pseudocardius, Fetus amorphous* (named after anatomical abnormality), *Chorioangiopagus parasiticus* (named because of the total dependence on the normal co twin).[2]

The pathophysiological basis is TRAP, occurring early in embryogenesis. There is vascular communication between the twins in homozygotic type. The vascular communication in the acardiac twin is different in that the acardiac twin receives blood supply from the normal twin (pump twin) through umbilical artery which is mostly deoxygenated. Hence it leads to secondary organ atrophy in the recipient (acardiac) twin.[3] Hence mortality for acardiac twin is 100 percent and of the pump twin is 50-70 percent, usually due to heart failure and sometimes prematurity caused by polyhydramnios.[4]

Pump twin is typically structurally normal in majority of the cases. Congestive cardiac failure usually develops due to increased cardiovascular demand, resulting in preterm delivery.[4] It also may develop cardiomegaly, hepatosplenomegaly, pericardial and pleural effusion, ascites and polyhydramnios.

In diamniotic acardiac twin cases, polyhydramnios and oligohydramnios were found in the pump and acardic twin respectively.[5]

Acardiac fetus is clinically divided into two types. Pseudocardiac type has cardiac structures but rudimentary. Halocardiac type has absence of cardiac structure development. It is classified into four subgroups morphologically.[6,7]

Acardiac acephalic

The fetus has developed pelvis and lower extremities. Head, arms and thoracic organs are absent. This is the most common type with a frequency of 60-75 percent. The case reported here belongs to this type.

Acardiac anceps

Here body and extremities have developed. Head and face are partially formed. This constitutes approximately 20 percent of cases.

Acardiac acormus

Here only head of fetus has developed. It is quite rare and constitutes approximately 10 percent of all cases.

Acardiac amorphous

Here fetus has no identifiable organs. It is an amorphous tissue mass and constitutes approximately 5 percent of all cases.

The occurrence of morbidity and mortality of pump twin were strongly related to the ratio of acardiac and pump twin's weight (APTW). If APTW ratio was above 70 percent, the incidence of preterm delivery, hydramnios and pump twin CHF was 90, 40 and 30 percent respectively. If APTW ratio is less than 70 percent, the complications were 75, 30 and 10 percent respectively.[4]

The principle of management of acardiac twin pregnancy is to save the pump twin by disconnecting blood flow to the acardiac twin.

Minimal invasive treatment modalities for vascular occlusion of acardiac twin are of 2 types, cord occlusion procedures and intrafetal ablation procedures. Both procedures can be done either by ultrasound or by foetoscopic guidance. Cord occlusion can be done by alcohol, coil, suture material ligation, monopolar or bipolar diathermy, laser.

Intrafetal ablation targets the abdominal aorta and pelvic vesselsof acardiac twin. This can be done by absolute alcohol, monopolar diathermy, laser, radiofrequency ablation.[6]

Foetoscopic approach requires expertise and is expensive.

CONCLUSION

Early diagnosis of chorionicity of placenta in twin pregnancies, early differentiation of acardiac twin from fetal demise, vascular occlusion techniques to occlude the recipient twin cord or abdominal aorta at proper time, close surveillance of the surviving pump twin, timely intervention to deliver it, all may reduce perinatal mortality of donor twin and improve its survival outcome.

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