

# Successful treatment of very PPROM caused by bipolar cord coagulation in acardiac twin

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## Summary

The authors report management of a woman with an acardiac twin pregnancy complicated by preterm premature rupture of the membrane (PPROM) for more than two months after intrauterine treatment with bipolar cord coagulation at 24 weeks of gestation.

*Key words:* Acardiac twin; Preterm premature rupture of the membrane; Bipolar cord coagulation.

## Introduction

Acardiac malformation, also known as twin reversed arterial perfusion (TRAP) sequence, complicates approximately one of 35,000 pregnancies and occurs in 1% of monochorionic twin gestations [1]. The pump twin that perfuses blood to the acardiac twin may experience heart failure and fetal hydrops resulting in a poor perinatal outcome. Here the authors present a case of acardiac twin pregnancy in which obliteration of blood supply to the acardiac twin using bipolar cord coagulation, underwent preterm premature rupture of the membrane (PPROM), but still resulted in a good postnatal outcome for the pump twin.

## Case Report

A 26-year-old woman (gravida 5, para 1) conceived monochorionic diamniotic (MCDA) twins by nature. She was referred to the present hospital for further evaluation at 23 weeks of gestation, as an acardiac twin pregnancy was suspected from the results of a routine obstetric ultrasound examination. An ultrasonographic evaluation of the pump twin demonstrated appropriate growth for gestational age and polyhydramnios with 14 cm maximum depth of amniotic fluid. Fetal karyotype analysis after amnion cavity puncture of the pump twin was normal. Intrauterine treatment with bipolar cord coagulation was approved by the ethical review board of West China Second University Hospital, Sichuan University. Because the acardiac twin was with no amniotic fluid, the authors could not perform amnioinfusion, and chose umbilical cord coagulation instead of radiofrequency ablation. They inserted the bipolar forceps through trocar into the pump twin's amniotic cavity under ultrasonographic guidance, then grasped the portion of the umbilical cord near the placental insertion site. Bipolar coagulation was started using 15W applied for 30 seconds with progressive energy increments of five W up to a maximum of 30W until the arrest of blood flow could be demonstrated with colour Doppler. Bipolar cord coagulation was

able to drain 2,500 ml of amniotic fluid. Within 12 hours after this procedure, the sacrificed fetus underwent PROM. The authors added penicillin to avoid infection and magnesium sulfate for tocolysis. The patient was monitored with routine blood test, C-reactive protein, tested cervical and vaginal secretion culture once a week, and electronic fetal heart rate monitoring biweekly. There was no sign of infection and premature labor for more than two months. At 33 weeks and five days of gestation, the emergency cesarean section was performed because fetal distress was suggested by electronic fetal heart rate monitoring. The male pump twin weighed 1,870 grams with Apgar scores of 9 at one minute and 10 at five minutes and was transferred to NICU. He stayed in NICU for seven days before discharged. He was followed up for three years and has been in good health until now. Pathologic evaluation showed complete thrombosis of the umbilical vessel and a macerated acardiac fetus (Figure 1), and the placenta and membranes revealed mild infection. The patient's features in this study

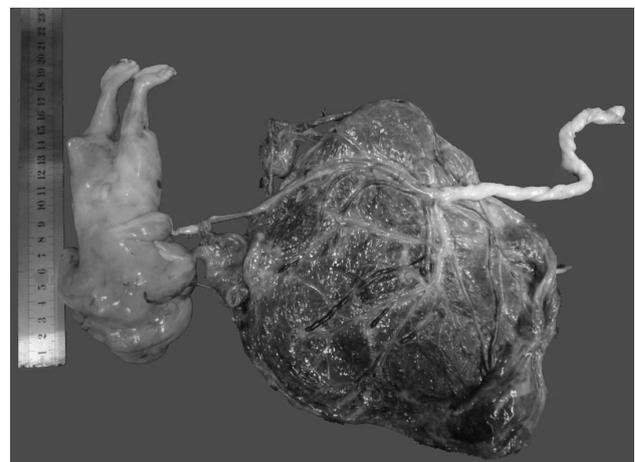


Figure 1. — Gross pathology of acardiac fetus and placenta.

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provided written informed consent for the procedures.

## Discussion

Acardiac twin is a serious complication of monochorionic multiple pregnancies in which the affected twin is reversely perfused from the healthy co-twin, resulting in severely abnormal or absent cardiac development, severe malformations, and massive hydrops fetalis. It is reported that minimally invasive surgical technique, such as ultrasound-guided bipolar cord coagulation, ultrasound-guided funicular techniques (coiling of the umbilical cord, alcohol-impregnated suture material for cord ligation, and other thrombogenic materials) and fetoscopic operations (cord ligation or laser ablation), offer effective treatment options in the management of acardiac twins [2, 3]. There is also case report of high-intensity focused ultrasound (HIFU) applied to the umbilical artery of the anomalous twin for TRAP sequence. However, due to the rarity of this condition and the heterogeneity of its presentation, no single technique has been shown to be unequivocally optimal. Perinatal survival rates range from 74% to 93% after treatment of TRAP [3, 4]. The most common postoperative complication after treatment of TRAP is PPROMs, which occurred in 57% patients [5], and subsequent preterm labor frequently reported.

PPROM is defined as spontaneous rupture of the membranes before 37 weeks of gestation and before the onset of regular contractions. PPROM continues to be a serious pregnancy complication. It is the precursor for approximately 25% to 30% of preterm deliveries. The majority of women with PPROMs fail to achieve significant pregnancy prolongation from membrane rupture to delivery ("latency"), with three-fourths of such women delivering within a week after conservative management [6]. The complications of PPROMs are spontaneous labor, infection, or placental abruption, fetal umbilical cord compression because of oligohydramnios, cord prolapse, fetal sepsis, and even stillbirth. Pregnancy prolongation after PPROMs, however, increases the potential for development of overt clinical chorioamnionitis. A retrospective cohort study of PPROMs between 14 and 24 weeks of gestation reported that median gestational age at delivery was 23.6 weeks, and 36.4% (16/44) fetuses survived to discharge [7].

Chorioamniotic infection and membrane separation may take place in any intrauterine invasive procedure. The present authors used prophylactic penicillin to avoid infection and magnesium sulfate for tocolysis. A Cochrane review

[8] reports antibiotics given during conservative management of PPROM, can delay delivery, reduce maternal chorioamnionitis, and decrease infectious and gestational age-dependent newborn complications. Blood test, C-reactive protein, cervical and vaginal secretion culture, and ultrasound examinations are helpful to identify any early infection and membrane separation for better management.

Early diagnosis, intensive prenatal care, and multidisciplinary consultation are recommended in management of this case. The present team included obstetricians, sonographer pediatricians, anesthesiologists, pediatric surgeons, and nurses. As survival rates following live birth of an infant with acardiac twin continue to improve, better evaluation would seem to be required, both to long-term nutritional and neuro-developmental outcomes.

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