

CASE REPORT

Diagnosing the Rare: Clinical Experience in Acardia Twin Recognition - A Case Report.

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Abstract

Twin Reversed Arterial Perfusion (TRAP) sequence or acardiac twin, is a rare condition in monochorionic twin pregnancies, presenting significant diagnostic and management challenges. Early detection of TRAP is crucial to improve foetal outcomes, particularly for the pump twin. We report the case of a 37-year-old gravida 5, para 3 + 1, who was initially misdiagnosed with a singleton pregnancy based on clinical and ultrasound examinations conducted at both primary and secondary health facilities. A marked discrepancy between the symphysiofundal height and ultrasound parameters later led to reassessment, revealing a twin pregnancy complicated by TRAP sequence. Radiofrequency ablation (RFA) was successfully performed on the acardiac twin at 28 weeks. The pregnancy ended at 30 weeks gestation with preterm birth, in which the pump twin was delivered alive while the acardiac twin was stillborn. This case highlights the importance of vigilant antenatal assessment, timely diagnosis, and intervention to optimise outcomes in TRAP sequence pregnancies.

Keywords: *Acardiac twin, antenatal diagnosis, fetal outcome, monochorionic twin pregnancy, Twin Reversed Arterial Perfusion (TRAP) sequence.*

Introduction

Twin Reversed Arterial Perfusion (TRAP) sequence is a rare condition that only occurs in monochorionic twin pregnancies. This condition is characterised by the presence of one twin with an underdeveloped or absent heart (acardiac twin), perfused by its co-twin (pump twin) through placental arterial anastomoses. The incidence of TRAP sequence has traditionally been estimated at 1 in 35,000 pregnancies, or 1 in 100 monozygotic twin pregnancies. However, with advances in ultrasound diagnostics and the increasing use of assisted reproductive technologies, the incidence appears to be rising [1]. Accurate diagnosis and early intervention are vital to improve foetal outcomes, particularly for the pump twin, which is at risk of significant morbidity and mortality.

Case report

A 37-year-old woman, gravida 5, para 3 + 1, with underlying beta-thalassemia trait, presented to the health clinic with a history of amenorrhea for 5 months. She reported experiencing foetal movements and sought antenatal care. This was the first pregnancy with her second husband, who had a first-degree family member with twins. It was a non-consanguineous marriage. At booking, she was asymptomatic and well. No prior ultrasound had been performed. Physical examination revealed a gravid uterus corresponding to 22 weeks of gestation. An obstetric abdominal ultrasound examination showed a singleton foetus at 21- 22 weeks with no apparent abnormalities. The patient confirmed the accuracy of her menstrual dates and denied using any contraceptive medication. A follow-up ultrasound was arranged to confirm the gestational age. However, three days later, she was admitted to the hospital with maternal pyrexia, likely due to influenza. The initial obstetric evaluation by the O&G team during admission again revealed a singleton foetus with no detected abnormalities. However, prior to discharge, a significant discrepancy between the

gestational age estimated by clinical symphysiofundal height (28 weeks) and the ultrasound parameters (singleton foetus corresponding to 22 weeks), led to a consultation with an obstetrician. A careful ultrasound examination by the obstetrician revealed a twin pregnancy with no separating membrane, one normal twin, and another twin showing no head and thoracic cavity with multiple cystic lesions in the abdominal cavity (Figure 1), consistent with twin reversed arterial perfusion (TRAP) sequence. The patient was referred to the maternal foetal medicine unit for further management. Following detailed counselling, the patient consented to radiofrequency laser ablation (RFA) at 28 weeks gestation. Post-procedure doppler ultrasound confirmed the absence of blood flow to the acardiac twin. At 30 weeks, cervical funneling by ultrasound warranted admission for intravenous magnesium sulphate and corticosteroids, followed by an emergency lower segment caesarean section. The pump twin was delivered weighing 1.41 kg with APGAR scores of 8 and 9 at 1 and 5 minutes, respectively. The acardiac twin, weighing 0.5 kg, was stillborn, with post-mortem findings confirming the malformations observed on the ultrasound. The surviving twin was later discharged in stable condition at 2.1 kg after three weeks in the neonatal intensive care unit.

Discussion

Twin reversed arterial perfusion (TRAP) sequence, also known as acardiac twin, is a rare condition exclusively happens in monochorionic twin pregnancies, with a prevalence estimated between 1 in 9,500 to 1 in 44,000 births [2]. In TRAP, abnormal vascular connections between the twins lead to the development of an acardiac twin. This case illustrated the acardiac acephalus form, the most common type of acardiac twin, where the foetus displays no cranial development as well. Early diagnosis is critical as delayed detection of the TRAP sequence may result in adverse outcomes for the pump twin. Doppler

ultrasound is able to detect reversed blood flow in the acardiac twin as early as the first trimester. Advanced imaging like MRI in the second trimester can further confirm the diagnosis [3]. Early intervention in the TRAP sequence significantly improves the prognosis of the pump twin. Without appropriate and timely intervention, the burden on pump twin's cardiovascular system increases as the acardiac twin grows, leading to the risks of heart failure, foetal hydrops, and intrauterine death. [4] There are several interventions that could improve the prognosis of the pump twin, with radiofrequency ablation (RFA) and intrafoetal laser (IFL) being the two commonly preferred techniques, alongside expectant management. As demonstrated in this case, RFA has shown to have better outcomes, with higher live birth rates and lower rates of foetal complications and intrauterine death compared to IFL and expectant management. Specifically, the live birth rate from RFA was 70.6% compared to 66.7% with expectant management [5]. The optimal timing for intervention is still debated, but early treatment has been proposed to reduce first-trimester demise and improve overall outcomes [6]. This case highlights the complexity of diagnosing TRAP sequence, particularly when early ultrasound even fails to detect the twin pregnancy. Despite the late diagnosis, successful management through RFA at 28 weeks ensured the survival of the pump twin. Although the pregnancy was complicated by preterm delivery, the outcome for the foetus has been favourable.

Conclusion

The presented case underscores the diagnostic and management challenges of TRAP sequence, particularly the importance of thorough clinical and ultrasonography evaluations when discrepancies in gestational age arise. While early

detection is key to optimizing foetal outcomes, this case demonstrates that effective management can still result in favourable outcomes for the pump twin, even with a late diagnosis.

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Conflict of interest

There is nothing to declare.

Patients' consent for the use of images and content for publication

The patient gave written consent to use the image and the case for publication.

Authors' contribution

Siti Dzulaikha Zulkifli: Writing, editing, and literature review.

Nor Azam Kamaruzaman: Writing, editing, literature review and supervision.

Mohd Daud Che Yusof: Editing and supervision.

What is new in this case report compared to the previous literature?

This case report emphasizes the crucial role of precise clinical correlation between symphysiofundal height measurement and obstetric ultrasound findings during antenatal examinations, in arousing clinical suspicion of a twin pregnancy.

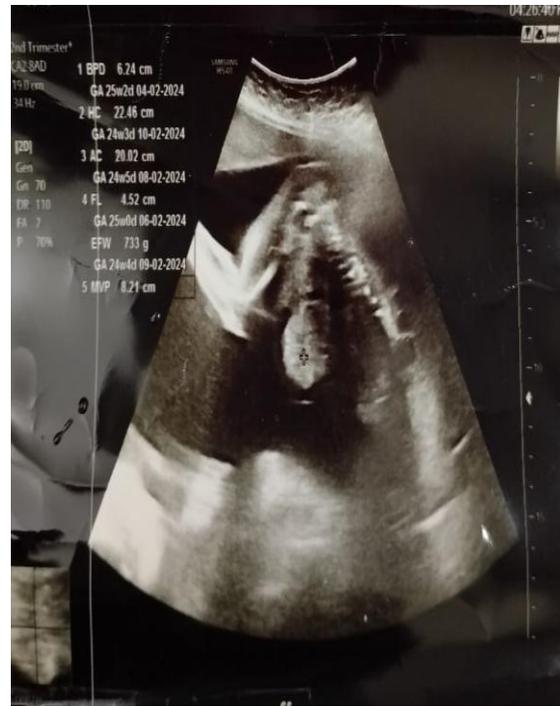
It's important to recommend practices that could increase early detection rates, such as increased training for sonographers on the specific ultrasound markers of the TRAP sequence and other rare twin complications.

What is the implication to patients?

Delayed detection of the twin pregnancy especially TRAP sequence may result in adverse outcomes to the pump twin.



1(a)



1(b)

Fig. 1(a) and 1(b). Ultrasound findings of the acardiac twin. Figure 1(a) Transverse view: multiple dilated bowels in the abdominal cavity. Figure 1(b) Sagittal view: malformed foetus with no head and poorly developed trunk with omphalocele, the lower limbs were well formed.

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