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Case Report

Dichorionic diamniotic twin pregnancy complicated by single intrauterine fetal demise secondary to severe early-onset fetal growth restriction: a case report

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ABSTRACT

Twin pregnancies are associated with increased maternal and perinatal morbidity compared with singleton gestations. Single intrauterine fetal demise (IUFD) complicates a small proportion of twin pregnancies but poses significant diagnostic and management challenges, particularly when it occurs in the second or third trimester. Although adverse outcomes are more commonly reported in monochorionic twins, dichorionic diamniotic (DCDA) pregnancies may also be affected, especially in the presence of severe placental insufficiency and early-onset fetal growth restriction (FGR). A 39-year-old multigravida (Gravida 2) with a history of one prior missed miscarriage conceived a DCDA twin pregnancy following ovulation induction. Early anomaly scans showed structurally normal fetuses. At 22 weeks of gestation, Twin B demonstrated severe early-onset FGR (below the 1st centile), oligohydramnios, and abnormal umbilical artery doppler with absent to reversed end-diastolic flow, suggestive of significant placental insufficiency, while Twin A showed appropriate growth and normal doppler parameters. Despite close antenatal surveillance with serial ultrasonography and doppler studies, follow-up imaging at 26-28 weeks revealed intrauterine fetal demise of Twin B, with ultrasonographic features including spalding sign and marked growth restriction corresponding to 19-20 weeks of gestation. The surviving Twin A remained hemodynamically stable with normal growth and reassuring doppler findings. This case underscores that DCDA twin pregnancies are not immune to severe complications such as single IUFD, particularly in the setting of early-onset FGR and placental insufficiency. Early diagnosis, meticulous fetal and maternal surveillance, and individualized management are essential to optimize outcomes for the surviving twin and ensure maternal safety.

Keywords: Twin pregnancies, Single intrauterine fetal demise, Fetal growth restriction

INTRODUCTION

Twin pregnancies are inherently associated with a higher risk of maternal, fetal, and neonatal complications when compared with the singleton gestations. These risks include preterm birth, fetal growth restriction, hypertensive disorders, and increased perinatal morbidity and mortality. One of the most challenging complications in the multiple gestations is single intrauterine fetal demise (IUFD), which has been reported to complicate up to 6% of twin pregnancies.[1,2] The clinical implications of single fetal demise vary considerably depending on the gestational age at demise, chronicity, and the underlying etiology. Death of one twin during the first trimester is relatively common and is often associated with minimal adverse effects on the surviving fetus, commonly manifesting as a vanishing twin phenomenon. However, single fetal demise occurring in the second or third trimester is associated with significantly higher risks for the surviving twin, including preterm birth, fetal growth

restriction, neurological injury, and perinatal death, as well as potential maternal complications such as disseminated intravascular coagulation.[3,4]

The risk profile is notably influenced by chronicity, with monochorionic twin pregnancies carrying a substantially higher risk of adverse neurological outcomes due to shared placental circulation, whereas dichorionic diamniotic (DCDA) twin pregnancies generally have a more favorable prognosis.[5,6] Severe early-onset fetal growth restriction (FGR) is an important contributor to adverse outcomes in twin pregnancies and is often a manifestation of underlying placental insufficiency.

When severe FGR is complicated by abnormal doppler findings, particularly absent or reversed end-diastolic flow in the umbilical artery, the risk of intrauterine fetal demise increases substantially. In DCDA twin pregnancies, selective fetal compromise due to placental insufficiency may result in demise of one twin while the co-twin continues to grow appropriately, necessitating careful surveillance and individualized management strategies.[7]

Given the rarity and clinical complexity of single IUFD in DCDA twin pregnancies, particularly when secondary to severe early-onset FGR, detailed case reports remain valuable for highlighting diagnostic challenges, antenatal surveillance, and management considerations. This case report describes a DCDA twin pregnancy complicated by single intrauterine fetal demise of one twin due to severe early-onset fetal growth restriction and placental insufficiency, with an ongoing viable co-twin.

CASE REPORT

A 39-year-old multigravida woman (Gravida 2) with a history of one previous missed miscarriage before 15 weeks of gestation presented for routine antenatal evaluation at our tertiary care center. The current pregnancy was conceived following ovulation induction without in-vitro fertilization. The patient had a sure last menstrual period dated 27 April 2025. There was no history of consanguinity, chronic medical illness, or significant family history of genetic or congenital disorders. Antenatal care had been regular since early gestation. An early obstetric ultrasound confirmed a DCDA twin pregnancy.

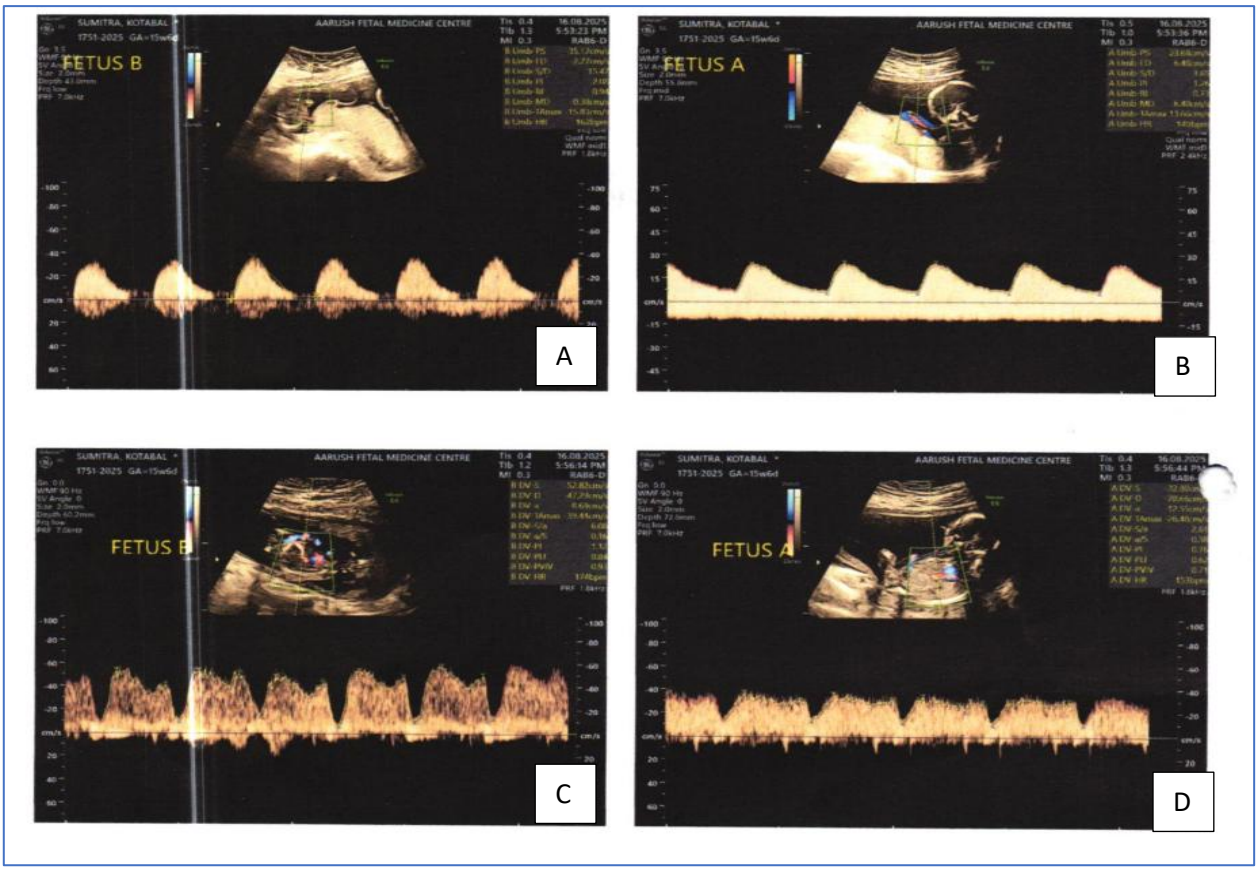

Figure 1 (A-D): Color doppler and spectral doppler evaluation of umbilical artery flow in a dichorionic diamniotic twin pregnancy. The upper and lower panels demonstrate doppler waveforms of fetus A and fetus B, respectively. Fetus A: preserved umbilical artery diastolic flow with relatively normal pulsatility, consistent with reassuring fetoplacental circulation. In contrast, fetus B: markedly abnormal umbilical artery doppler findings with increased pulsatility and absent to reversed end-diastolic flow, indicative of severe placental insufficiency and early-onset fetal growth restriction, preceding intrauterine fetal demise.

At approximately 15-16 weeks of gestation, a detailed fetal anatomical assessment was performed. Both fetuses demonstrated structurally normal anatomy, including normal intracranial structures, spine, facial profile, thoracic structures, cardiac anatomy, abdominal situs, kidneys, urinary bladder, and long bones.

At this stage, Twin A showed growth appropriate for gestational age with normal amniotic fluid volume and normal doppler parameters. Twin B, however, demonstrated a relatively lower estimated fetal weight with amniotic fluid volume at the lower limit of normal. The placentas were separate, with Twin A having a posterior placenta and Twin B an anterior placenta, confirming dichorionicity.

A detailed mid-trimester anomaly scan at 22 weeks of gestation reconfirmed the DCDA chronicity. Twin A was in cephalic presentation with growth appropriate for gestational age, normal amniotic fluid volume, normal uterine artery doppler indices, and a normal cervical length. In contrast, Twin B showed evidence of severe early-onset fetal growth restriction, with estimated fetal weight below the 1st centile for gestational age.

This was associated with oligohydramnios. Doppler evaluation of Twin B revealed abnormal umbilical artery flow, characterized by increased pulsatility index with absent to reversed end-diastolic flow, suggestive of significant placental insufficiency. These findings indicated a poor fetal prognosis for Twin B, while Twin A continued to demonstrate reassuring growth and doppler parameters.

The patient was closely monitored with serial ultrasonography and doppler surveillance. On a follow-up twin growth scan at approximately 26-28 weeks of gestation, Twin A, located on the maternal left side, was live with reassuring fetal heart activity of approximately 142 beats per minute, appropriate interval growth, normal amniotic fluid volume, and normal umbilical artery doppler indices. In contrast, Twin B, located on the maternal right side, demonstrated absence of fetal cardiac activity and movements.

Ultrasonographic features of IUFD of Twin B were noted, including the presence of spalding sign, minimal pleural effusion, altered abdominal echogenicity, and marked growth restriction corresponding to approximately 19-20 weeks of gestation. The placenta corresponding to Twin B appeared more advanced in maturity when compared with the placenta of Twin A, supporting the diagnosis of severe placental insufficiency as the likely etiology. The maternal cervix remained long and closed, and maternal uterine artery doppler parameters were within normal limits.

Based on the clinical and imaging findings, a diagnosis of dichorionic diamniotic twin pregnancy complicated by single intrauterine fetal demise of Twin B secondary to severe early-onset fetal growth restriction and placental insufficiency, with a continuing live Twin A pregnancy, was made. The patient was counseled regarding the diagnosis, prognosis, and need for continued close antenatal surveillance of the surviving twin.

DISCUSSION

Twin pregnancies were known to be associated with significantly higher perinatal morbidity and mortality when compared with singleton gestations. The incidence of twin pregnancies varied across geographical regions, being reported as <8 per 1000 births in East Asia and Oceania, 9-16 per 1000 births in the USA, Europe, and India, and ≥17 per 1000 births in African countries.[8] Among twin gestations, single IUFD remained a rare but clinically challenging complication, complicating up to 6% of twin pregnancies, with potential adverse consequences for the surviving co-twin.[9] In the present case, a DCDA twin pregnancy was complicated by single fetal demise in the late second trimester, which aligned with existing literature indicating that fetal demise occurring beyond the first trimester carried a higher risk of adverse outcomes than early pregnancy loss.[9] While the incidence of antepartum fetal death was reported to be higher among monochorionic twins (3.7%), and monochorionic placentation accounted for 50%-70% of single IUFD cases in twins, the current case highlighted that DCDA pregnancies were not immune to severe complications, particularly when profound placental insufficiency and early-onset FGR were present.[2-10]

The etiology of fetal demise in twin pregnancies was multifactorial and included twin-to-twin transfusion syndrome, placental insufficiency, intrauterine growth restriction, infections, velamentous cord insertion, cord accidents, and congenital or structural anomalies. In the present case, severe early-onset FGR with abnormal umbilical artery doppler findings, including absent to reversed end-diastolic flow, strongly suggested placental insufficiency as the primary cause of fetal demise, consistent with mechanisms described in previous studies.[6-9] Importantly, structural anomalies were excluded on serial detailed ultrasonography, strengthening the attribution of demise to placental pathology.

Chorionicity played an important role in determining outcomes for the surviving twin. Monochorionic pregnancies were associated with a higher risk of acute hemodynamic instability in the surviving twin following fetal demise, due to shared placental circulation, potentially resulting in sudden hypotension and ischemic brain injury.[6] Neurological abnormalities were reported in approximately 18% of monochorionic twins, compared with only 1% in dichorionic twins, emphasizing the comparatively favorable prognosis in DCDA gestations.[6] In the present case, the surviving Twin A continued to demonstrate appropriate growth, normal doppler parameters, and reassuring fetal heart activity, supporting the protective role of dichorionic placentation in preventing acute circulatory compromise.

Ultrasonographic surveillance remained the cornerstone of management following single IUFD in twin pregnancies.[11] In accordance with published recommendations, the patient in this case underwent serial ultrasound and doppler monitoring, which enabled early detection of fetal compromise, confirmation of IUFD, and ongoing assessment of the surviving twin. Rapid delivery was not pursued, as there were no signs of fetal anemia, cardiotocographic abnormalities, or maternal instability, consistent with literature suggesting that immediate delivery was generally unwarranted in stable cases.[11]

Maternal complications such as disseminated intravascular coagulation (DIC), resulting from prolonged retention of the dead fetus and release of thromboplastins into the maternal circulation, had been previously reported, particularly in late gestation losses.[10] In the present case, maternal condition remained stable, with normal uterine artery doppler parameters and no evidence of cervical change, highlighting the importance of vigilant maternal monitoring even in DCDA pregnancies.

Neurodevelopmental assessment of the surviving twin was emphasized in the literature, with antenatal and postnatal magnetic resonance imaging recommended to detect subtle brain injury.[12] Although long-term follow-up data were not yet available in this case, the preserved growth and doppler findings of Twin A suggested a favorable short-term prognosis. Additionally, antenatal corticosteroid administration between 24 and 34 weeks was recommended if delivery was anticipated within seven days to promote fetal lung maturity, underscoring the need for individualized, gestation-specific management strategies.[13]

Overall, this case confirmed existing evidence that while DCDA twin pregnancies carried a better prognosis than monochorionic pregnancies following single IUFD, severe placental insufficiency and early-onset FGR could still result in fetal demise. The case highlighted the importance of early diagnosis, meticulous ultrasonographic surveillance, doppler evaluation, and individualized antenatal management to optimize outcomes for the surviving twin.

CONCLUSION

Single IUFD in a dichorionic diamniotic twin pregnancy, although less common than in monochorionic gestations, can occur secondary to severe early-onset fetal growth restriction and placental insufficiency. This case highlights the importance of early identification of fetal growth abnormalities, close ultrasonographic and doppler surveillance, and individualized antenatal management to optimize maternal safety and outcomes for the surviving twin.

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