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Twin-To-Twin Transfusion Syndrome In A Dichorionic Diamniotic Twin Pregnancy: A Rare Case Report

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Abstract
Twin-to-twin transfusion syndrome (TTTS) is a severe complication of twin pregnancies, classically occurring in monochorionic gestations due to shared placental vascular anastomoses. Its occurrence in dichorionic diamniotic (DCDA) twin pregnancies is exceptionally rare and sparsely reported. We present a rare case of advanced-stage TTTS in a DCDA twin pregnancy.
A 20-year-old primigravida with a spontaneously conceived DCDA twin pregnancy, diagnosed at 9 weeks of gestation by the presence of a lambda sign, presented at 31 weeks with decreased fetal movements. Ultrasonography revealed intrauterine fetal demise of the recipient twin with polyhydramnios and hydrops fetalis, and a live donor twin with oligohydramnios, severe fetal growth restriction, and reversed end-diastolic flow in the umbilical artery, consistent with Quintero Stage V TTTS. Following antenatal corticosteroids and magnesium sulphate administration, an emergency cesarean section was performed. Placental examination demonstrated two distinct placental discs with a large vascular anastomosis connecting them, confirming placental fusion as the likely etiology. The donor twin survived with neonatal intensive care support, while the recipient twin was stillborn.
This case highlights the rare occurrence of TTTS in DCDA pregnancies and emphasises the importance of considering TTTS in the differential diagnosis of dichorionic twins presenting with discordant growth, amniotic fluid imbalance, or Doppler abnormalities.

Keywords - *Twin-to-twin transfusion syndrome; Dichorionic diamniotic twins; DCDA; Rare case report*

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I. Introduction

Twin-to-twin transfusion syndrome (TTTS) is a serious complication of twin pregnancies, occurring almost exclusively in monochorionic gestations due to placental vascular anastomoses. It affects 10–15% of monochorionic twin pregnancies and is associated with significant perinatal morbidity and mortality. TTTS occurring in dichorionic diamniotic (DCDA) twin pregnancies is extremely rare and scarcely reported in literature. The most accurate period for determination of chorionicity is between 9 and 12 weeks of gestation, using ultrasonographic markers such as the lambda (twin-peak) sign. TTTS results from chronic unbalanced intertwin blood transfusion through deep arteriovenous placental anastomoses, leading to hemodynamic imbalance. The recipient twin develops hypervolemia, polycythemia, polyhydramnios, and cardiac overload, while the donor twin develops hypovolemia, anemia, oligohydramnios, and fetal growth restriction. Advanced disease is associated with hydrops fetalis and intrauterine fetal demise. Severity is classified using Quintero's staging system, based on ultrasonographic and Doppler findings. Twin to twin transfusion syndrome is associated with high moribidity rate of 40-70%. Perinatal morbidity is significantly reduced with intrauterine intervension such as serial amnioreduction, fetoscpic laser photo coagulation of placental anastomosis and selective cord occlusion in severe cases.

II. Case Report

A 20-year-old primigravida with spontaneous conception presented at 31 weeks of gestation with a dichorionic diamniotic twin pregnancy diagnosed at 9 weeks of gestation by ultrasonography showing the lambda sign. She presented with decreased fetal movements for two days. Handheld Doppler examination revealed only one fetal heart sound. Emergency ultrasonography showed intrauterine demise of Twin A (recipient twin) with polyhydramnios and hydrops fetalis. Twin B (donor twin) was live with oligohydramnios, severe fetal growth restriction, and Doppler evidence of reversed end-diastolic flow in the umbilical artery, consistent with Stage V TTTS (Quintero classification).

Fetus	A	B
DCDA	30.2 weeks	28.1weeks
Presentation	Breech	Breech
Placenta	Posterior high	Posterior high
Liquor	Polyhydramnios SDP -8.1	Oligohydramnios SDP-1.0
EFW	1810 g	1420g <5th percentile, s/o FGR
Doppler		Increased umbilical PI with Reversed end diastolic flow

Antenatal corticosteroids were administered for fetal lung maturity, and magnesium sulphate was given for neuroprotection. The patient underwent emergency cesarean section. Both twins were delivered in breech presentation. Placental examination revealed a diamniotic dichorionic placenta with two distinct placental discs connected by a large vascular anastomosis. One placental disc was enlarged with congested vessels corresponding to Twin A, while the other was smaller with thin vessels corresponding to Twin B. Twin A was confirmed as intrauterine fetal demise with oedema over body. Twin B weighed 1340 g, cried immediately after birth, and was admitted to the neonatal intensive care unit. The mother had an uneventful postoperative course and was discharged on day three. The neonate was discharged on day 52 after stabilisation.

III. Discussion

TTTS is classically described in monochorionic twin pregnancies; however, its occurrence in DCDA twins is extremely rare. The most accepted explanation is fusion of dichorionic placentas with development of significant vascular anastomoses, allowing intertwin blood transfusion similar to monochorionic gestations. This hypothesis is supported in the present case by placental findings of two separate placental discs connected by a large vascular communication. Misclassification of chorionicity is another proposed mechanism, but this was unlikely in the present case due to early ultrasonographic identification of the lambda sign and postnatal confirmation of separate amnion and chorion layers. Advanced stages of TTTS, particularly Stage V, are associated with poor perinatal outcomes. In present case there was intrauterine fetal demise of recipient twin due to cardiac overload.

IV. Conclusion

Although TTTS is traditionally considered a complication exclusive to monochorionic twin pregnancies, rare cases can occur in dichorionic diamniotic pregnancies due to placental fusion and vascular anastomoses. This case emphasizes the importance of considering TTTS in DCDA twins presenting with discordant amniotic fluid volumes, fetal growth restriction, or Doppler abnormalities. Early recognition and prompt management are essential to improve perinatal outcomes.

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