

CASE REPORT

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Management of fetal-fetal transfusion syndrome in COVID-19 pandemic: case report

Manejo del síndrome de transfusión feto fetal en pandemia COVID-19: reporte de caso

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ABSTRACT

The twin-to-twin transfusion syndrome (TTTS) is a potentially lethal complication that can occur in monochorionic twin pregnancies due to an imbalance in placental blood flow. Diagnosis is based on amniotic fluid discordance and classified using the Quintero staging system. The primary treatment is fetoscopic laser photocoagulation (FLP) of placental anastomoses. A successful case of FLP treatment in a monochorionic diamniotic twin pregnancy with TTTS during COVID-19 pandemic in Peru is presented.

Key words: Pregnancy, multiple, Twin-to-twin transfusion syndrome, Prenatal diagnosis, Fetoscopy, Surgery, fetal

RESUMEN

El síndrome de transfusión feto-fetal (STFF) es una complicación propia de los embarazos gemelares monocoriales, con mortalidad perinatal del 80 a 100%. Ocurre por un desequilibrio en el flujo sanguíneo placentario entre ambos gemelos. El diagnóstico se basa en la discordancia del líquido amniótico y luego se clasifica en estadios según los criterios de Quintero. El tratamiento principal es la fetoscopia y fotoablación con energía láser (FFL) de las anastomosis placentarias. Presentamos un caso de gestación gemelar monocorial biamniótica tratado con FFL en plena cuarentena e inmovilización de la pandemia COVID-19 en Perú, que incluyó diagnóstico oportuno y referencia rápida para recibir el tratamiento especializado.

Palabras clave. Embarazo gemelar, Transfusión feto-fetal, Diagnóstico prenatal, Fetoscopia, Feto, cirugía

INTRODUCTION

The frequency of monochorionic (MC) twin pregnancy is 1/250 pregnancies and represents 20% of all twin pregnancies⁽¹⁾. In recent years there has been an increase in its incidence, so it is more common to observe obstetric and neonatal complications⁽²⁾. The most important complication in MC pregnancies is the twin-to-twin transfusion syndrome (TTTS), a complex condition in which there is an imbalance in the exchange of blood flow through the placental anastomoses⁽³⁾. This complication causes hypovolemia in one 'donor' twin and hypervolemia in the other 'recipient' generating a cascade of hormone-mediated renal and cardiovascular alterations in both twins. This can result in 80-100% perinatal mortality and 15-50% neurological morbidity in the survivors⁽⁴⁾.

The diagnosis of TTTS requires the presence of significant amniotic fluid discordance⁽⁵⁾ where the 'donor' twin has oligohydramnios, defined as a maximum vertical pocket (MVP) of amniotic fluid less than 2 cm, and the 'recipient' twin has polyhydramnios, defined as a MVP of amniotic fluid greater than 8 cm⁽⁶⁾. Quintero staging is currently used to classify TTTS and estimate survival (Table 1)^(7,8). Mild cases are usually managed expectantly, while severe cases require fetoscopy and laser photocoagulation of the anastomosis (LPA) between 16-26 weeks of gestation⁽⁹⁾.



It is reported that with LPA treatment it is possible to obtain survival of at least one fetus in 85% of cases and of both fetuses in 50% of operated cases, being lower in Quintero stages III/IV^(10,11). On the other hand, there are potential complications of fetoscopy such as premature rupture of membranes, preterm labor, and bleeding⁽²⁾.

Early diagnosis and timely therapy, such as LPA, can significantly improve the survival and long-term outcome of twins affected by TTTS. Thus, careful prenatal surveillance is essential in biamniotic monochorionic twin pregnancies to warn of severe complications such as TTTS.

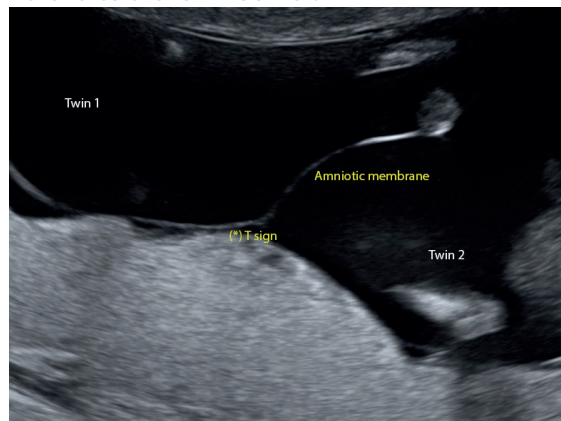
During the first months of the COVID-19 pandemic, Peru experienced a period of strict confinement in which reference hospitals in large cities were collapsed due to the large number of patients with COVID-19.

CASE REPORT

We present the clinical case of a 29-year-old female, mestizo, G2 P1001, with a history of previous cesarean section evaluated at the fetal medicine unit of the Ayacucho Regional Hospital (HRA), Peru. The 13-week ultrasound (Figure 1) showed a biamniotic monochorionic twin gestation without further observations.

Due to the gap in appointments, the next ultrasound was performed at 21 weeks of gestation when amniotic fluid discordance was evident with a vertical shaft of 7.0 cm and 0.8 cm for the recipient and donor twins, respectively (Figure 2a). Donor twin 1 had growth below the 10th percentile and no bladder visualization (Figure

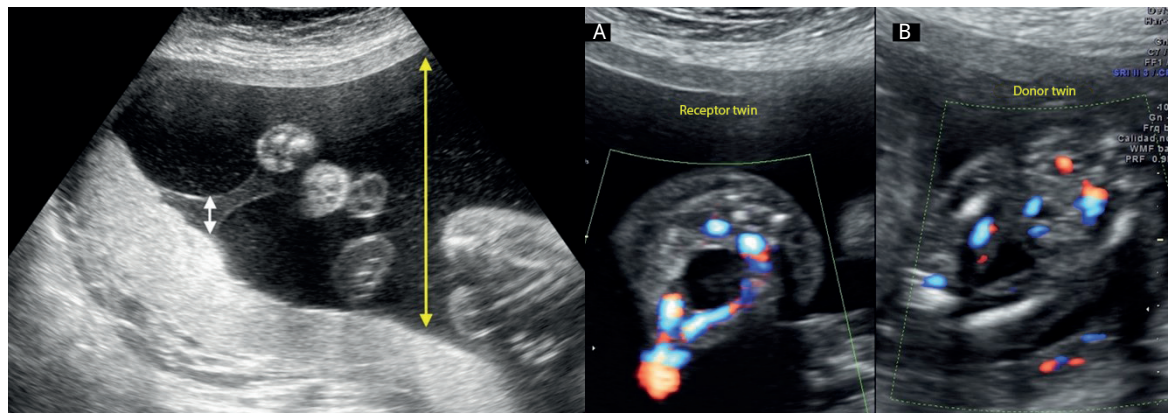
FIGURE 1. VISUALIZATION OF THE INSERTION OF THE AMNIOTIC MEMBRANE FORMING AN INVERTED T ('T' SIGN), WHICH INVARIABLY INDICATES A BIAMNIOTIC MONOCHORIONIC TWIN GESTATION.



2b). Recipient twin 2 had growth at the 19th percentile with bladder visualization (Figure 2b). The diagnosis of Quintero stage II TTTS was proposed.

In April 2020, at the beginning of the COVID-19 quarantine and with all the restrictions, referral to the Instituto Nacional Materno Perinatal (INMP) in Lima, Peru, was proposed. The referral and management were coordinated with the various specialties and logistic actors involved so that the patient could undergo treatment and counter-referral in the same transfer ambulance, since transfers for hospitalization were not accepted due to the saturation of the institutions. The surgery was performed by the INMP fetal surgery team only two hours after her arrival at the institution (Figure 3). The patient was able to return in the same ambulance two hours after the fetal surgery, and the entire recovery process was carried out at the Ayacucho Regional Hospital.

FIGURE 2. ULTRASOUND IMAGE OF GESTATION AT 21 WEEKS. 2A. POLYHYDRAMNIOS-OLIGOHYDRAMNIOS SEQUENCE. 2B. BLADDER BARELY VISIBLE IN THE DONOR TWIN AND DISTENDED IN THE RECIPIENT TWIN.





The patient evolved favorably after the procedure with amniotic fluid vertical pockets of 38 and 35 mm, respectively, and cervicometry of 17 mm.

Forty days after the fetoscopy, the patient was hospitalized for premature rupture of membranes. She underwent emergency cesarean section and confirmed the diagnosis of placental abruption in 10%. Two live newborns of 920 g and 1,010 g were obtained that remained in the neonatal intensive care unit of the ARH for 83 days. The infants evolved favorably until the day of their discharge and were in good health at the time of writing this article.

DISCUSSION

TTTS is a complication that affects about 10-15% of monochorionic pregnancies⁽¹²⁾. It occurs when there is predominantly unidirectional intergemellar blood flow through pathologic placental vascular anastomoses. The diagnosis of chorio- nicity is important and determines the prognosis of these pregnancies⁽¹³⁾. In our case, we were

able to determine chorioamniocity in the first trimester allowing early diagnosis and subsequent timely treatment of TTTS.

TTTS is currently classified using the Quintero staging system. At the time of preoperative evaluation at INMP it was classified as Quintero stage III and emergency fetal surgery was performed⁽¹²⁾. LPA is the treatment of choice for severe cases before 27 weeks and has been shown to improve perinatal outcomes. It is important to keep in mind that complications may arise during the LPA procedure, such as premature rupture of membranes, recurrence of TTTS, polycythemia anemia sequence, among others⁽¹²⁾. Our patient presented preterm premature rupture of membranes resulting in severe oligohydramnios. However, both babies survived after 83 days of hospitalization with no apparent perinatal sequelae at discharge. They are currently two years old and the mother reports that in the pediatric controls the development shown has been adequate with no observations or need for referral to another specialty.

TTTS is an obstetric emergency in which both fetuses require immediate attention and treatment which should not be deferred due to distance or transportation problems. The health system must guarantee the correct referral to centers with diagnostic and therapeutic capacity and medical teams with proven experience. That is the important reason to communicate this case which occurred in a very adverse scenario in the country. At a time when all resources were destined to COVID-19 and when no cases were being referred for fetal surgery, it was possible to coordinate a referral and counter-referral that resulted in the benefit of the patient and her twins, in addition to strengthening fetal surgery with excellence in the country⁽¹³⁾.

FIGURE 3. ENDOSCOPIC IMAGE OF PLACENTAL VESSELS, 3A BEFORE PHOTOABLATION AND 3B DURING PHOTOABLATION WITH LASER ENERGY.

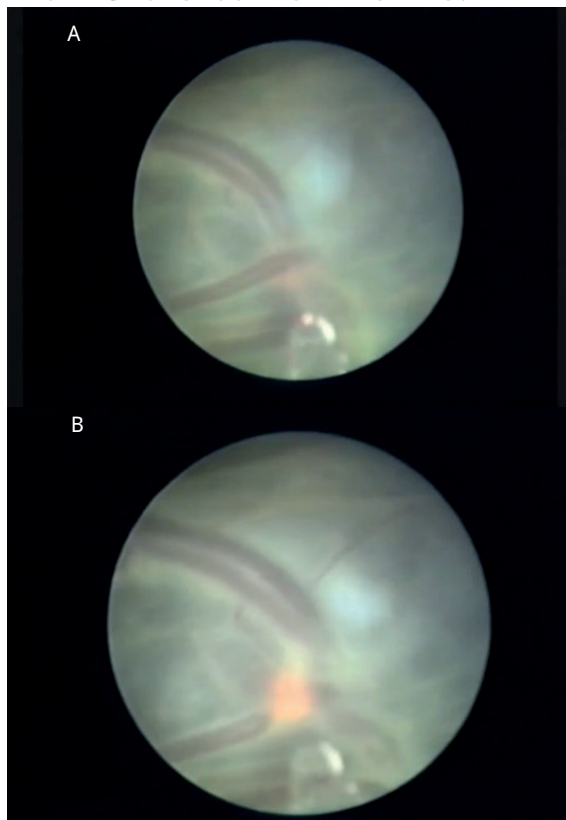


TABLE I: QUINTERO'S CLASSIFICATION SYSTEM.

Stage	Classification
I	Polyhydramnios-oligohydramnios sequence: MVP > 8 cm in the recipient twin and MVP < 2 cm in the donor twin.
II	The bladder of the donor twin is not visible on ultrasound.
III	Absent or reversed diastolic flow in the umbilical artery, reversed A-wave flow in the ductus venosus, pulsatile umbilical venous flow in either twin.
IV	Hydrops in one or both twins.
V	Death of one or both twins.

MVP: Maximum Vertical Pocket



In conclusion, twin-to-twin transfusion syndrome is an important complication in monochorionic twin pregnancies where early and timely diagnosis is the mainstay of management. Timely referral to a center with resolution capacity for fetoscopy has a great impact on the reduction of perinatal mortality due to this complication.

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