

Twin-to-Twin Transfusion Syndrome

Twin-to-twin transfusion syndrome (TTTS) is a rare complication of pregnancy that develops in 10-15% of twins when the babies share the same placenta (monochorionic). TTTS can occur in any gestation, even triplets or quadruplets, when two or more babies share their placenta. All babies who share a placenta share blood supply through connecting blood vessels. If the blood is shared equally, the babies will do fine. Unequal sharing of blood flow can cause TTTS. It most often develops in the second trimester of pregnancy but can happen at any point.

When babies are diagnosed with TTTS, the baby sending more blood to the other will make less urine and have less fluid around them (oligohydramnios). They may also be smaller. This baby is called the 'donor'. The baby receiving more blood will have extra fluid around them (polyhydramnios). This baby usually grows normally and is called the 'recipient'.

When TTTS develops, it is dangerous for both babies involved with a high chance of death if there is no treatment (over 90% risk for most cases). Offering treatment increases the chances the babies can survive and be healthy.

Diagnosis of TTTS

TTTS is diagnosed by ultrasound. Since it can arise quickly, it is important that pregnancies with a shared placenta be screened and followed closely with ultrasound looking at the amount of fluid around the babies. We recommend beginning regular ultrasounds at 16 weeks gestation and following closely for the rest of pregnancy. Additional evaluation including fetal echocardiogram to evaluate heart function or a fetal MRI of the baby's brain may be helpful to completely assess the pregnancy.

Quintero Staging System for TTTS

A system known as Quintero Staging is used to describe the severity of TTTS:

- *Stage I:* There is reduced amniotic fluid (oligohydramnios) around the donor. The donor bladder can still be seen. The recipient has extra amniotic fluid (polyhydramnios). A special ultrasound measurement (Doppler) of blood flow moving through the umbilical cord of each baby is normal and bladders are seen on both babies.
- *Stage II:* Low fluid and extra fluid persist as above. The donor bladder is no longer seen on the ultrasound exam. The Doppler study shows normal blood flow through the cord of each baby.
- *Stage III:* In addition to the findings in Stage I, the Doppler studies in this phase are abnormal in at least one of the babies.
- *Stage IV:* This stage is used when there is progression to hydrops in one of the babies. Hydrops is when there is extra fluid in the baby's chest, abdomen, around the heart, or in the skin. This is usually due to heart failure in the recipient.

Management of pregnancy

In addition to regular prenatal care for multiple gestations, twins who share a placenta will have frequent ultrasounds (every 2 weeks beginning at 16 weeks as mentioned above) to monitor the health of both babies. Additional antenatal testing will be used as the pregnancy progresses.

Fetal intervention for TTTS

Fetal intervention is an option for some families. The most common option is selective laser ablation of fetal vessels or laser therapy to treat the underlying cause of TTTS by stopping blood flow through the connecting blood vessels between the babies.

This is safely done between 16 and 26 weeks gestation for appropriate patients.

If laser therapy is not an option for a patient or if they prefer a different treatment, amnioreduction to remove the extra fluid from around the recipient is offered. Amnioreduction is performed by inserting a needle into the uterus and into the sac of the recipient twin to remove this fluid. The fluid levels and the response of the babies are monitored with ultrasound during the procedure. This is a temporary treatment for most cases and 80% of TTTS cases will need more than one amnioreduction when this is done without laser treatment.

In the past, some patients were offered a treatment called septostomy. This is a procedure that makes tiny holes in the dividing membrane to let amniotic fluid cross the membranes between the babies in an attempt to balance the fluid level between them. This is no longer used as it can create additional problems for some pregnancies.

These treatment options are complex and need to be discussed in detail with patients to review all of the options possible. Care needs to be individualized for each patient.

Delivery of babies with TTTS

Premature delivery is not uncommon with this condition. This can be due to early labor, early or premature rupture of membranes, or due to complications that result in a recommendation for early delivery. The diagnosis of TTTS does not mean a cesarean delivery is needed, although it is more common with twins. Depending on the gestational age at delivery, there may be a need for the babies to be admitted to a neonatal intensive care unit (NICU). Michigan Medicine is one of only a few centers nationwide at which the birth center is co-located within a comprehensive children's hospital. This unique setting allows for seamless integration between our private-room birth center, state-of-the-art newborn intensive care unit (NICU), and access to around-the-clock pediatric surgical services in one convenient location.

Postnatal treatment of TTTS

Because many babies with TTTS are born prematurely, they may be in the hospital longer than their mothers. The duration of their stay, and their overall health is often dependent on how early they are born. Because of the higher risk for problems related to TTTS, they should be followed closely by their pediatrician who should be aware of the pregnancy course and any treatments.

Future pregnancy risk

There is no reason to think TTTS was something that could be prevented or that it was caused by any particular action. This is not something that would be expected to run in families nor to happen in another pregnancy. Your doctor and a genetic counselor can review the risk with you.

Make an appointment

For more information or to schedule an appointment call 734-763-6295.

