What You Need to Know When Managing Twins
10 Key Facts

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KEYWORDS
• Twins • Chorionicity • Anomalies • Fetal echocardiography • Discordant growth
• Twin-twin transfusion syndrome • Twin delivery

KEY POINTS
• Accurate dating and determination of chorionicity is critical in the management of twin pregnancies.
• Structural anomalies, placental abnormalities, cervical shortening, and fetal growth disturbances are all more common in twins.
• Because of the unique complications related to monochorionicity, serial surveillance is recommended throughout gestation to optimize outcomes.

10 KEY FACTS
1. Twins Are Common

A twin pregnancy is no longer a novel occurrence. Twins now compromise more than 3% of all live births in the United States.1 Advances in reproductive technologies have been the main driver of this increase, but practitioners need to maintain a high level of suspicion when certain clinical characteristics are detected. Before the routine use of ultrasound, more than half of twin gestations were undiagnosed until the intrapartum period.2 In contemporary obstetrics, timely detection is expected by patients and provides the best opportunity to optimize care of these potentially complicated pregnancies (Box 1).

2. Establish Due Date Early

Correct dating is of paramount importance for the proper management of twin pregnancies. Correct dating is highlighted by recent reviews that recommend that uncomplicated dichorionic twins be delivered at 38 weeks, monochorionic twins at 36 weeks,
and monoamniotic twins at 34 weeks compared with 41 weeks for singletons. For both twins and singletons, pregnancy dating is best performed in the first trimester using the crown-rump length (CRL). Accuracy of the CRL to predict the due date before 14 weeks is 5 to 7 days. In the second and third trimesters, multiple biometric measurements are used to calculate gestational age, but this approach is less precise. In patients that present late for care with uncertain menstrual dates, a repeat ultrasound in 3 to 4 weeks to assess interval growth can be useful to confirm the assigned due date. For twins conceived by means of in vitro fertilization (IVF), the due date should be calculated from the age of the embryo and date of transfer. Regardless of how a pregnancy was conceived, dating can be ambiguous if there is a significant size discrepancy between the twins. In these cases, dating using the larger twin decreases the risk of overlooking early intrauterine fetal growth restriction (IUGR), but the smaller CRL has been shown to be more accurate in the estimation of gestational age in twins. Serial evaluation of twin growth may help to clarify pregnancy dating when early ambiguity exists.

3. Chorionicity Is Critical

Chorionicity has a significant impact on obstetric management and risks for complications. Unlike dizygotic twins that are always dichorionic, monozygotic twins may be dichorionic or monochorionic depending on when the embryo split. Correct assignment of chorionicity is close to 100% when carried out in the first trimester but decreases to 90% in the second trimester. A recent study found that before 20 weeks, ultrasound incorrectly assigned chorionicity in 6.4% of twins overall with 4% of dichorionic twins and 19% of monochorionic twins misclassified. Thus, chorionicity should be established at the time of the initial ultrasound, optimally in the first trimester.

Early in the first trimester, the number of gestational sacs equals the number of chorions, and a few weeks later, the visualization of 2 separate placentas can be used to establish dichorionicity. In twins with a single or fused placenta, characteristics of the intervening membrane can help distinguish between dichorionic and monochorionic placentation. Membrane thickness, number of layers, and the presence of either the λ or the T-sign can be evaluated by early ultrasound. In dichorionic twins, the

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**Box 1**

Clinical suspicion of twins

- Larger than expected uterine size
- Strong family history of fraternal twins
- Severe hyperemesis gravidarum
- Elevated serum β-HCG
- Use of assisted reproductive technologies

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**Box 2**

Importance of accurate dating in twins

- Correct timing for screening and diagnostic testing
- Accurate interpretation of twin growth
- Appropriate initiation of antenatal testing
- Optimal scheduling of twin deliveries
A separating membrane is thicker because it is composed of 2 amnions and 2 chorions, compared with only 2 layers of amnion in monochorionic twins. Although a membrane thickness of 2 mm has been suggested as a threshold to distinguish between dichorionic and monochorionic twins, it does not perform reliably as a single diagnostic test.\(^{11}\) The \(\lambda\) sign, consisting of placental tissue observed between the layers of the intervening membrane at its base, is diagnostic of dichorionicity (Fig. 1).\(^{12}\) The T-sign, which is composed of the 2 opposing amnions at the base of the separating membrane, is characteristic of monochorionic placentation (Fig. 2). Although gender

<table>
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<tr>
<th>Timing of Embryo Splitting in Monozygotic Twins (d)</th>
<th>Frequency (%)</th>
<th>Placentation</th>
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<tr>
<td>2–3</td>
<td>30</td>
<td>Dichorionic, diamniotic</td>
</tr>
<tr>
<td>3–8</td>
<td>70</td>
<td>Monochorionic, diamniotic</td>
</tr>
<tr>
<td>8–13</td>
<td>&lt;1</td>
<td>Monochorionic, monoamniotic</td>
</tr>
</tbody>
</table>

**Table 1**

Types of placentation in monozygotic twins

*Fig. 1.* Two placentas with twin peak sign (arrow) diagnostic of dichorionic placentation. A, twin A; B, twin B.

*Fig. 2.* T-sign (arrow) at base of thin separating membrane with single placenta diagnostic of monochorionic diamniotic placentation. A, twin A; B, twin B.
is not useful if both twins are the same, different phenotypic genders imply dichorionicity except in rare cases.

Establishing amnionicity is also important in monochorionic twins because monoamniotic twins have increased risks and are managed differently than diamniotic twins. The presence of a separating membrane ensures the presence of 2 amnions in both dichorionic and monochorionic gestations. In some cases, the intervening membrane in monochorionic twins can be extremely thin and difficult to visualize early in gestation, leading to an incorrect assignment of monoamnionicity. Transvaginal ultrasound and repeat imaging may be necessary to distinguish between twins with monochorionic diamniotic and monoamniotic placentation. The number of yolksacks is not a reliable diagnostic criterion for amnionicity.

4. Trisomy 21 Screening Is Similar

As in singleton pregnancies, nuchal translucency (NT) is important for the assessment of risk for aneuploidy and anomalies in twins. The sensitivity of NT combined with maternal age for trisomy 21 is similar in twins and singletons, but the screen-positive rate is higher, particularly in monochorionic twins.13 Even in the absence of trisomy 21, twins with monochorionic placentation have increased NT measurements compared with dichorionic twins.14 These increased NT measurements may reflect the higher likelihood of structural abnormalities in identical twins as well as the potential for complications related to intertwin anastomoses within a shared placenta. The detection rate for Down syndrome in twins can be increased by combining maternal age and NT with serum levels of free β-human chorionic gonadotropin (β-HCG) and pregnancy-associated plasma protein A (PAPP-A), but chorionicity must be taken into consideration (Table 2).15,16

A cystic hygroma may be unexpectedly observed at the time of NT screening. Although an assortment of chromosomal and structural abnormalities have been associated with large NT and first-trimester cystic hygroma, both are risk factors for congenital cardiac anomalies.17,18 Functional as well as structural heart disease occurs more frequently in monochorionic twins. An additional benefit of assessing the NT in twins with monochorionic placentation is that a 20% intertwin difference has more than a 30% risk of fetal death or the subsequent development of severe twin-twin transfusion syndrome (TTTS), thereby identifying cases that require increased scrutiny during follow-up surveillance.19

Maternal serum screening in the second trimester with the quadruple test may be used for patients presenting late for care as long as the presence of twins is taken into consideration when interpreting the results. Although cell-free fetal DNA testing is not yet endorsed by the American College of Obstetricians and Gynecologists for

<table>
<thead>
<tr>
<th>Trisomy 21 Screening</th>
<th>Nuchal Translucency (%)</th>
<th>Combined with Free β-HCG and PAPP-A (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monochorionic twins</td>
<td>73</td>
<td>84</td>
</tr>
<tr>
<td>Dichorionic twins</td>
<td>68</td>
<td>70</td>
</tr>
<tr>
<td>All twins</td>
<td>69</td>
<td>72</td>
</tr>
<tr>
<td>All singletons</td>
<td>73</td>
<td>85</td>
</tr>
</tbody>
</table>

Adapted from Cleary-Goldman J, Berkowitz RL. First trimester screening for down syndrome in multiple pregnancy. Semin Perinatol 2005;29:399; with permission.
5. **Malformations Not Rare**

The purpose of the second-trimester anatomic survey in twins is the same as for singletons: to provide reassurance that the fetuses are developing normally with no suspected structural anomalies. Patient preparation before ultrasound is essential because twins have a higher background risk for major malformations than the 2% reported in singletons. Although the rate per fetus remains roughly the same in dizygotic twins, this amounts to an overall rate of 3% to 4% for the pregnancy. For patients with monochorionic twins, the frequency of congenital anomalies is nearly twice that in twins with dichorionic placentation. Furthermore, in about 90% of twin pregnancies with a congenital anomaly, only one twin is affected, and when both twins have an anomaly, only 10% of dichorionic and 20% of monochorionic twins have the same structural defect. As a result of these risks, a high level of suspicion for abnormalities is warranted when scanning twins.

In singleton pregnancies, only one-third to one-half of all congenital anomalies are diagnosed prenatally, and the detection rate is expected to be even lower in multiple gestations. Certain malformations, such as those involving the central nervous system, are usually detected during routine ultrasound, whereas major heart defects are frequently missed in twins. This finding is of clinical importance because congenital heart disease is more common in monochorionic twins, with a prevalence of 7.5%. Although controversial, there are some data to suggest that twins conceived by IVF are also at increased risk for cardiac anomalies irrespective of chorionicity. The cardiac screening examination, consisting of the 4-chamber view and views of the outflow tracts, detects about one-third of congenital heart defects prenatally. Fetal echocardiography, when done in experienced centers, can detect close to 100% of major cardiac anomalies so twins at increased risk should undergo fetal echocardiographic evaluation. Given the challenge of imaging multiple fetuses in variable positions in mid gestation, repeat ultrasound examinations may be necessary to complete the twin anatomic surveys and ensure the absence of major malformations. The management of discordant twin anomalies will depend on the gestational age at diagnosis, placentation, type of defect, and potential for associated pregnancy complications (Box 3).

6. **Confirm Placental Location**

The evaluation of each placenta is an important component of the ultrasound examination of multiple gestations. Placenta previa is 40% higher in twins, likely related to the larger placental mass. Vasa previa is also more common due to velamentous cord insertions, found in 10% of twins compared with 1% of singletons. A transvaginal ultrasound with color flow imaging can easily eliminate the presence of a placenta or fetal vessels overlying the cervix (Fig. 3). Given the high rate of perinatal

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**Box 3**

**Indications for fetal echocardiography specific to twins**

- Spontaneous monochorionic twins
- All IVF conceived twins
- Complicated monochorionic twins (conjoined twins, TRAP syndrome, TTTS, TAPS)
mortality associated with undiagnosed vasa previa, routine transvaginal ultrasound with color is recommended in twins.

The placental cord insertion (PCI) of each twin should also be routinely evaluated with color flow imaging. In addition to diagnosing vasa previa, velamentous PCIs are more frequent in monochorionic diamniotic twins and are associated with an increased likelihood of TTTS, unequal placental sharing with discordant twin growth, and selective IUGR. Furthermore, perinatal mortality is increased 3-fold in monochorionic twins found to have a velamentous PCI. Routine PCI determination can help identify monochorionic diamniotic twins that warrant increased sonographic surveillance for TTTS and disturbances in twin growth. The early detection of these conditions should trigger adjustments in management that may help to reduce the risk of perinatal death.

### 7. Check Cervical Length

Although universal screening is controversial, cervical length assessment is informative when caring for patients with preexisting risk factors for preterm delivery. Given more than one-half of all twins deliver before term, an awareness of cervical length tends to impact patient counseling and obstetric care. The transvaginal approach is optimal for the determination of cervical length and the response to Valsalva or fun- dal pressure. In the second trimester, a cervical length of 20 to 25 mm or less is found in 5% to 10% of twins and increases the likelihood of a preterm birth 3-fold to 5-fold (Table 3). The negative predictive value of a mid trimester cervical length of greater than 35 mm is more than 90%, which provides reassurance to patients with twins. Although the optimal cervical length threshold and the frequency of follow-up cervical

<table>
<thead>
<tr>
<th>Cervix &lt;20 mm at 20–24 wk</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Positive LR</th>
<th>Negative LR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm birth &lt;28 wk</td>
<td>35</td>
<td>93</td>
<td>5.2</td>
<td>0.69</td>
</tr>
<tr>
<td>Preterm birth &lt;32 wk</td>
<td>39</td>
<td>96</td>
<td>10.1</td>
<td>0.64</td>
</tr>
<tr>
<td>Preterm birth &lt;34 wk</td>
<td>29</td>
<td>97</td>
<td>9.0</td>
<td>0.74</td>
</tr>
</tbody>
</table>

**Abbreviation:** LR, likelihood ratio.


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Fig. 3. Velamentous cord insertion of twin A near cervix.
assessments are uncertain, a baseline measurement in the mid trimester and serial assessments at the time of subsequent growth studies in the second trimester and early third trimester can identify those at highest risk for spontaneous preterm birth.

8. Follow Twin Growth

The traditional approach to estimating fetal weight in singletons, using abdominal palpation and symphysis fundal height, is unreliable in twins. Because the assessment of fetal growth is of critical importance when managing twins, serial sonographic evaluation of fetal biometry is warranted.\textsuperscript{38} Sequential growth scans can detect early growth restriction or discordance that might otherwise be missed and identify those cases that require increased fetal surveillance.

Singletons and twins tend to follow similar growth patterns until the third trimester, at which time twin growth begins to lag.\textsuperscript{39} IUGR, defined as an estimated fetal weight of 10th percentile or less for gestational age, can be assigned using singleton or twin growth curves. A conservative approach for following twin growth is to use singleton curves so that cases of poor growth are not overlooked. Although there are different definitions of growth discordance, the most commonly used is a variance of 20\% or more, calculated as the difference in the estimated fetal weights of the twins divided by the estimated fetal weight of the larger twin. An early sonographic clue of developing discordant growth is disparate abdominal circumferences (Fig. 4). An intertwin abdominal circumference difference of 20 mm or more or a ratio of less than 0.93 is predictive of discordant birth weights.\textsuperscript{40} Both IUGR and twin discordance are associated with a higher likelihood of fetal and perinatal death compared with normally grown and concordant twins.\textsuperscript{41,42} Following twin growth every 4 weeks is recommended for the early detection of growth abnormalities and timely initiation of antenatal fetal testing.\textsuperscript{38}

Amniotic fluid abnormalities, such as oligohydramnios and polyhydramnios, may also be identified incidentally during routine growth studies. Although there are different methods to assess amniotic fluid volume in twins, a popular approach is to measure the maximal vertical pocket (MVP) in each sac. Using this method, oligohydramnios is defined as an MVP less than 2 cm, and polyhydramnios is defined as an MVP of greater than 8 cm.\textsuperscript{12,34} As in singletons, cases of oligohydramnios and polyhydramnios require additional investigations to determine the underlying cause as well as ongoing antenatal testing to ensure twin well-being. TTTS should be considered when both conditions, or oligohydramnios-polyhydramnios sequence, are

\textbf{Fig. 4.} Early discordant abdominal circumferences in monochorionic diamniotic twins. A, twin A; B, twin B.
detected in a monochorionic pair.\textsuperscript{34} In the third trimester, twin presentation should also be determined during ultrasound to aid in delivery planning, particularly when growth abnormalities are present. As skills in breech delivery decline, planned cesarean delivery is increasing for all twin pregnancies to avoid combined vaginal-cesarean births.

\section*{9. Monochorionic Twins at Risk Until Birth}

Although serial surveillance is justified in all twin pregnancies with anomalies, cervical shortening, fetal growth disturbances, and amniotic fluid abnormalities, monochorionic twins require extra scrutiny for several unique problems. Certain conditions associated with monochorionicity, such as monoamniotic twins, conjoined twins, and twin reversed arterial perfusion (TRAP) syndrome, tend to be recognized in the first trimester. In these rare cases, referral to a specialist with experience in complicated monochorionic twins is recommended for patient counseling and advice about subsequent care (\textbf{Box 4}).

\textbf{Unequal placental sharing with discordant twin growth and/or selective intrauterine fetal growth restriction}

Beyond the first trimester, seemingly uncomplicated monochorionic twins may yet face life-threatening situations because of the sharing of a single placenta. Although discordant twin growth and IUGR may complicate twins with dichorionic placentation, the cause and implications tend to differ in monochorionic twins. Discordant growth occurs in 15\% to 25\% of twins with monochorionic placentation.\textsuperscript{43,44} When compared with monochorionic twins with concordant growth, velamentous PCIs and unequally shared placentas are more common in cases with growth abnormalities.\textsuperscript{45} Selective IUGR in monochorionic twins has been classified into 3 clinical groups based on Doppler studies of the umbilical artery: type I has positive Doppler flow; type II has persistent absent or reversed end diastolic velocity flow; and type III has intermittent absent or reversed end diastolic flow.\textsuperscript{44} Early disturbances in twin growth, particularly when associated with abnormal diastolic flow in the umbilical artery, have the poorest prognosis with a 15\% to 20\% risk of intrauterine fetal demise.\textsuperscript{44} TTTS can coexist with unequal placental sharing, complicating the diagnosis and management of the pregnancy. Overall, the latency between the development of abnormal diastolic flow in the umbilical artery and fetal deterioration necessitating delivery tends to be longer in monochorionic twins compared with singletons with IUGR, but frequent surveillance is still warranted once fetal viability is reached.\textsuperscript{46}

\textbf{Twin-twin transfusion syndrome}

TTTS affects about 10\% of monozygotic twins and develops, in part, because of placental anastomoses that link the circulations of the twins.\textsuperscript{34} In affected pregnancies, blood flow in these anastomoses is unbalanced with one twin, the donor, transferring a net volume to its co-twin, the recipient. Factors associated with the

\begin{table}
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\begin{tabular}{|l|}
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\textbf{Box 4} \\
High-risk conditions associated with monochorionicity \\
\hline
\item Unequal placental sharing with discordant twin growth or selective IUGR \\
\item TTTS \\
\item TAPS \\
\item Single-twin demise \\
\hline
\end{tabular}
\end{table}
subsequent development of TTTS include velamentous PCIs and twin differences in NT and amniotic fluid volume. The diagnosis of TTTS is made by ultrasound so serial sonographic surveillance of monochorionic twins is necessary to detect this condition in its earliest stages. Oligohydramnios-polyhydramnios sequence, the finding of low fluid in one sac and high fluid in the other sac, is essential for the diagnosis of TTTS (Table 4). Doppler velocimetry of the middle cerebral arteries may demonstrate elevated peak systolic velocities in the donor twin, suggesting fetal anemia and reduced peak systolic velocities in the recipient twin, implying polycythemia consistent with coexisting twin anemia-polycythemia sequence (TAPS). Both fetal echocardiography and fetal MRI are ancillary studies that may provide additional information about the impact of TTTS on the twins. Cardiac dysfunction, biventricular hypertrophy, and functional or structural right ventricular outflow obstruction may develop in the recipient twin over time. Central nervous system abnormalities, such as hemorrhagic or ischemic changes, have been detected in cases of TTTS, which carries a less favorable prognosis.

Given the risk of TTTS in monochorionic twins, serial sonographic surveillance is recommended every 2 weeks beginning in the second trimester. Management options for TTTS vary depending on gestational age and stage at time of diagnosis. These options may include pregnancy termination, selective reduction of an anomalous, growth restricted, or hydropic co-twin, fetoscopic laser photocoagulation of intertwin placental anastomoses, amnioreduction, expectant observation, or delivery. Most cases of TTTS are detected in the second trimester, and, in advanced stages (II–IV), fetoscopic laser photocoagulation is currently considered the best treatment approach to improve perinatal survival. This procedure tends to be used between 16 and 26 weeks’ gestation and is performed in conjunction with an amnioreduction to normalize the fluid in the recipient’s sac immediately after laser completion. The management of stage I TTTS is controversial because only 10% to 30% of cases progress, whereas most cases remain stable, resolve spontaneously, or do not recur after a single amnioreduction.

Following laser therapy for advanced TTTS, serial sonographic surveillance is required to assess the twins’ response to treatment. When successful, TTTS resolves with normalization of amniotic fluid volume in both sacs, visualization of the donor’s bladder, and improvement in the recipient’s twin cardiac function. Umbilical artery Doppler studies may remain abnormal in the presence of coexisting unequal placental sharing with discordant twin growth and, in these cases, antenatal fetal testing should be incorporated into third-trimester management. Serial ultrasound evaluation for recurrent TTTS, reversed TTTS, TAPS, and unequal placental sharing is also recommended until delivery.

<table>
<thead>
<tr>
<th>Quintero TTTS Stage</th>
<th>Features</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>MVP fluid &lt;2 cm in the donor sac and &gt;8 cm in the recipient sac</td>
</tr>
<tr>
<td>II</td>
<td>Nonvisualization of the fetal bladder in donor twin for &gt;60 min</td>
</tr>
<tr>
<td>III</td>
<td>Absent or reversed umbilical artery diastolic flow, reversed ductus venosus a-wave flow, or pulsatile umbilical vein flow</td>
</tr>
<tr>
<td>IV</td>
<td>Fetal hydrops in 1 or both twins</td>
</tr>
<tr>
<td>V</td>
<td>Fetal demise in 1 or both twins</td>
</tr>
</tbody>
</table>

The prognosis of TTTS depends on the gestational age at diagnosis, clinical stage, and progression of disease. Early-stage TTTS that presents beyond 26 weeks and does not progress tends to have a favorable outcome for both twins. However, most advanced TTTS presents in the second trimester, and the overall expected perinatal survival after laser therapy in these cases is 50% to 70%. Without treatment, perinatal mortality is 70% to 100% in advanced stages of TTTS. Of pregnancies treated with fetoscopic laser, both twins survive in 50% of cases; a single twin survives in 30% of cases, and there are no surviving twins in 20% of cases. Although procedure-related twin loss is a recognized complication of fetoscopic laser photocoagulation, survival with neurologic handicap is a serious long-term sequela of TTTS, with or without treatment. Interventricular hemorrhage, cystic periventricular leukomalacia, and subsequent diagnosis of neurodevelopmental delay and cerebral palsy remain risks for survivors of TTTS. Overall, rates of long-term neurologic sequelae in laser-treated TTTS are 5% to 20%. Additional risks related to preterm delivery and prematurity may impact the long-term outcomes for the surviving twins of these complicated monochorionic diamniotic pregnancies.

**Twin anemia-polycythemia sequence**

Spontaneous TAPS occurs in 5% of monochorionic diamniotic twins and is usually not diagnosed until after birth. At delivery, one twin is pale and the other plethoric, and the twins are found to have discordant hemoglobins. Like TTTS, intertwin anastomoses in the monochorionic placenta result in a chronic imbalance of blood flow from donor to recipient; however, in TAPS the flow is presumably low and slow through small anastomoses so significant amniotic fluid abnormalities do not develop. Iatrogenic TAPS, observed in up to 10% of TTTS cases treated with fetoscopic laser photocoagulation, is more likely to be recognized before birth because of increased sonographic surveillance after laser. Incomplete coagulation of all pathologic anastomoses, particularly small unidirectional connections, can result in the development of TAPS.

Serial surveillance for iatrogenic TAPS should be routine after laser photocoagulation. Diagnosis is made by an elevated peak systolic velocity in the middle cerebral artery of greater than 1.5 MoM in one twin and less than 0.8 MoM in the other twin. Screening for spontaneous TAPS in otherwise uncomplicated monochorionic twins is not routine but should be considered when minor variances in amniotic fluid are detected during serial ultrasounds. Without the utilization of Doppler velocimetry, this may be the only sonographic clue of TAPS in otherwise uncomplicated twins with monochorionic diamniotic placenta. TAPS and TTTS can coexist, but the oligohydramnios-polyhydramnios sequence will be absent in TAPS. The management of TAPS is controversial, but options may include termination, observation, repeat laser, fetal transfusion, or delivery depending on gestational age. The perinatal outcome of TAPS is also uncertain, ranging from double twin demise to newborn twins with no obvious long-term sequelae. At the present time, prevention of iatrogenic TAPS is perhaps the best strategy to decrease the frequency of this condition and its adverse consequences.

**Single-twin demise**

Overall, it is expected that only 50% of spontaneous twin pregnancies identified in the first trimester will result in 2 live-born infants. The finding of a vanishing twin early in gestation is associated with a favorable prognosis of the surviving twin, similar to that of a singleton pregnancy. However, unlike the death of a dichorionic twin, the death of one monochorionic twin has potential risks to the well-being of its co-twin, because of
the shared placenta and intertwine anastomoses. Cases of neurologic injury and co-twin demise have been reported following the death of a monochorionic twin as early as 14 weeks’ gestation. Beyond the first trimester, intrauterine demise of one fetus occurs in about 5% of twin gestations. Twins with structural malformations are more likely to die in utero than their anatomically normal co-twins. The smaller twin of a discordant twin pair or a twin with early-onset IUGR is also more likely to die before birth. It is estimated that there is a 3-fold to 4-fold increase in intrauterine death in monochorionic twins compared with dichorionic twins. Complications unique to monochorionic twins that contribute to a higher likelihood of single-twin demise include cord entanglement in monoamniotic twins, conjoined twins, TRAP, TTTS, unequal placental sharing, and TAPS. Intrauterine death of one monochorionic twin is associated with a 10% risk of double fetal demise and a 10% to 30% risk of neurologic injury in the surviving co-twin. Immediate delivery of a monochorionic twin after demise of its co-twin does not eliminate the risk of neurologic handicap. Clinical management of these pregnancies depends on the gestational age and the detection of fetal or maternal complications.

10. Individualize Delivery of Twins

There are many different factors that influence the timing of twin deliveries. Active preterm labor, premature rupture of membranes, hemorrhage from placenta previa or abruption, as well as serious maternal conditions may require prompt preterm delivery. Once viability is reached and antenatal surveillance is initiated, expeditious delivery of twins is recommended regardless of gestational age if testing implies impending harm. General guidelines have been developed to assist the clinician with the scheduling of both complicated and uncomplicated twins, allowing some latitude for individualization (Table 5).

SUMMARY

Key points in managing twins, such as dating, determination of chorionicity, prenatal screening for chromosomal and structural abnormalities, and placental evaluation, should be standard practice. Cervical length measurements and fetal growth studies are recommended in twins, but the optimal timing and frequency of these assessments remain unclear. However, it is evident that monochorionic twins require serial

<table>
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<th>Recommended delivery of twin pregnancies</th>
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<td><strong>Twin Characteristics</strong></td>
<td><strong>Recommended Timing of Delivery</strong></td>
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<tr>
<td>Dichorionic, diamniotic</td>
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<tr>
<td>Dichorionic, diamniotic with IUGR</td>
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<tr>
<td>Monochorionic, diamniotic</td>
<td>34–37 wk</td>
</tr>
<tr>
<td>Monochorionic, diamniotic with IUGR or oligohydramnios, abnormal Doppler studies</td>
<td>32–34 wk</td>
</tr>
<tr>
<td>Diamniotic with single fetal death</td>
<td>If ≥34 wk, consider delivery</td>
</tr>
<tr>
<td></td>
<td>If &lt;34 wk, individualize</td>
</tr>
<tr>
<td>Monoamniotic with single fetal death</td>
<td>Consider delivery, individualize</td>
</tr>
<tr>
<td>Monoamniotic</td>
<td>32–34 wk</td>
</tr>
</tbody>
</table>

surveillance for a multitude of potential complications that are unique to twins sharing a single placenta. Although favorable outcomes can be attained for most twins, these pregnancies should never be considered low risk.

REFERENCES


