Overburdened and undernourished
Angelika Bord, MD; Simcha Yagel, MD; Dan V. Valsky, MD

CASE NOTES

A woman, gravida 2, para 1, was admitted at 30 weeks of pregnancy for suspected intrauterine growth restriction. Indeed, fetal ultrasound and echocardiography revealed that the fetus had an estimated weight of 700-800 g and a head-abdomen ratio of 1.26. Fetal biometry was consistent with symmetric intrauterine growth restriction (IUGR). Fetal anatomy, amniotic fluid volume, and placentation and cord insertion were all normal.

Doppler evaluation confirmed normal flow without notching in both uterine arteries. Flow parameters were also normal in a free loop of umbilical artery (peak systole/peak diastole or S/D = 4.25; resistance index or RI = 0.76), but diastolic flow was reversed or absent in other areas of the cord. Normal resistance was noted in the umbilical arteries near the placental cord insertion (S/D = 4.0; RI = 0.75). Elevated diastolic flow (S/D 2.86; RI = 0.65) in the middle cerebral artery reflected a brain-sparing effect. Flow in the ductus venosus was normal.

CONCLUSIONS

Signs of severe, early, symmetric IUGR, combined with normal parameters of placental resistance and areas of high umbilical artery resistance, suggested cord obstruction. Close examination of the umbilical cord with 3-dimensional power Doppler ultrasound revealed 4 nuchal cord loops (Figure 1). Color Doppler evaluation of these loops disclosed absent or reversed end-diastolic flow in associated portions of the umbilical arteries (Figure 2). Betamethasone was administered to promote fetal lung maturation. The fetus was closely followed with fetal monitoring 3 times a day and a daily sonographic biophysical score assessment. In the 31st week of pregnancy, repeated, severe, variable decelerations occurred, and an emergency cesarean section was performed. A male with extreme growth-restriction, weighing only 840 g, had 4 umbilical cord loops tightly encircling his neck (Figure 3). One loop had to be released before the neonate could be extracted. His Apgar scores and pH were normal.

Encirclement of the fetal neck by a nuchal cord occurs in 5.8–29% of all pregnancies and is generally considered benign. Development of fetal growth restriction in some of these cases is well established in the literature, and its severity is positively correlated to the number of encirclements. Generally, the more serious the compression and the
longer it persists, the more severe the sequelae that can develop.

The present case represents an interesting example of severe IUGR in which the etiological factor—multiple, tight nuchal cord loops—was suspected when discrepancies in Doppler blood flow parameters were found. Normal transplacental flow parameters were observed in conjunction with increased flow resistance in the umbilical arteries in a free loop of cord and absent-to-reversed flow in the nuchal loops.

Optimal management and timing of delivery for growth-restricted fetuses with cord abnormalities remain unresolved. In cases of IUGR resulting from chronic cord compression, it might not be feasible to stall delivery until fetal Doppler evaluations suggest that parameters and biophysical profile are worsening, because fetal deterioration or demise can be unpredictable. Early delivery is preferred when adequate neonatal intensive care is available.

REFERENCES