The yolk sac functions as the primary route of exchange between the embryo and mother prior to the establishment of the placental circulation. It is well established that an abnormally large yolk sac serves as a prognostic indicator for early pregnancy failure in singleton gestation. However, no studies have been performed to describe normal versus abnormal yolk sac diameters (YSD) in multiple gestations. In this case, we describe a patient with triplet pregnancy consisting of monochorionic-monoamniotic twins both with enlarged yolk sacs in addition to singleton pregnancy in a separate sac with a normal yolk sac. The monochorionic-monoamniotic twins were later diagnosed with a fetal demise suggesting large YSD may serve as a poor prognostic indicator in multiple gestations as well.

**Case Description**

A 34-year-old woman opting for in vitro fertilization (IVF) as treatment for primary infertility conceived after placement of 2 embryos on post-retrieval day 3. Quantitative hCG levels were higher than expected and transvaginal ultrasound at 6 weeks’ gestation demonstrated a triplet pregnancy with a singleton sac and a separate monochorionic-monoamniotic versus conjoined twin pregnancy with symmetrically enlarged yolk sacs, each with cardiac activity present (Figs. 1A and B). The yolk sacs associated with the twin pregnancy were 6.15 mm and 7.37 mm, respectively, while the singleton had a normal yolk sac. A repeat ultrasound 10 days later confirmed absence of fetal cardiac activity in the monochorionic-monoamniotic sac, with increased crown rump length of the singleton pregnancy, which maintained persistent cardiac activity. This embryo went on to normal development and delivery. A second example of a twin pregnancy with normal yolk sacs is shown in Figure 1C. In this example, these twins went on to sustain normal development and were delivered successfully.

**Abstract**

Enlargement of the yolk sacs is an ominous sign even in multi-gestational pregnancies.
Discussion

The routine use of ultrasound is a key feature in the modern management of early pregnancy. In particular, the yolk sac has been studied as a prognostic indicator for pregnancies. The secondary yolk sac is the primary source of exchange between the embryo and the mother during organogenesis. It is first visualized at 5 weeks' gestation, or when the gestational sac reaches 10 mm, and regresses by the 12th week of gestation in normal pregnancies. A normal range of yolk sac diameters has been described, particularly in singleton pregnancies with abnormal outcome in all cases where YSD was greater than 5.6 mm. Lindsay et al followed 486 first-trimester pregnancies and found a YSD >2SDs (standard deviations) above the mean was associated with abnormal outcomes with a sensitivity of 15.6%, specificity of 97.4%, and a positive predictive value of 60.0%. There is a paucity of data for normal versus abnormal YSD in multiple gestations. However, there is no reason to suspect that similar guidelines regarding enlarged yolk sacs and poor prognosis would not apply.

While it is widely accepted that monoamniotic twins share a yolk sac, recent evidence shows monoamniotic twins with 2 yolk sacs. This case also challenges the previously held idea that the number of yolk sacs is equal to amnionicity in both monochorionic-monoamniotic and monochorionic-diamniotic twin pregnancies. While the question of amnionicity may require further study, this case bears out the fact that abnormally large yolk sacs are predictive of abnormal pregnancy even in multiple gestations. Moreover, only the affected sacs with enlarged yolk sacs suffered the expected adverse sequelae. The singleton pregnancy was carried to term with no further evidence of the twin pregnancy following embryonic demise. This is, to the best of our knowledge, the first case report demonstrating that enlarged yolk sacs in twins may be associated with adverse outcomes similar to singleton pregnancies; the case also adds to the growing body of literature suggesting yolk sac number does not always correlate with amnionicity in first-trimester monochorionic multiple gestations.

References