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The Twin Peak Sign¹

APPEARANCE

The twin peak sign refers to a triangular projection of placental tissue extending from the placental surface, insinuating itself between the layers of the intertwin membrane, and seen on ultrasonographic (US) studies of multiple gestations. This placental tissue is widest at the placental surface and tapers gradually at a variable distance into the intertwin membrane (Fig 1) (1). This sign has also been referred to as the λ sign (2).

EXPLANATION

The twin peak sign indicates the presence of a dichorionic-diamniotic twin gestation (1). The twin peak represents the extension of placental villi into the potential space that is formed from the reflection of apposed amniotic and chorionic layers from each fetus (Fig 2). It forms where two separate placentas grow contiguously and appear fused. The twin peak can be of variable size, and only its presence is required to suggest that the pregnancy is dichorionic-diamniotic (1). This sign is most useful in assessing the chorionicity of pregnancies after 10 weeks (3). Prior to this time, gestational sacs are readily recognizable and allow a rapid and accurate determination of chorionicity.

DISCUSSION

Seventy percent of twins are dizygotic, resulting from the fertilization of two ova, whereas 30% are monozygotic, arising from a single fertilized ovum (4). Three placentation types can occur depending on the timing of the development of twins from fertilization. From earlier division to later, the three types

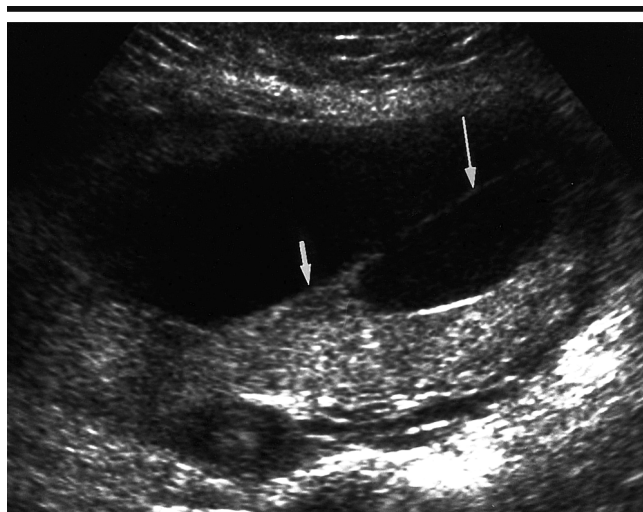


Figure 1. Transverse image of the placenta of a twin pregnancy at 17 weeks gestational age reveals a triangular peak of villi (short arrow) extending from the placenta into the intertwin membrane (long arrow): the twin peak sign. Amniocentesis confirmed the pregnancy to be dizygotic, with male and female fetuses.

of placentation are dichorionic-diamniotic, monochorionic-diamniotic, and monochorionic-monoamniotic. Dizygotic twins are always dichorionic. Monozygotic twins are dichorionic in one-third of cases, monochorionic-diamniotic in two-thirds of cases, and monochorionic pregnancies are seen in less than 1% of cases (4).

The only absolute sign of dizygosity on US studies is documentation of different sex fetuses. The twin peak sign is a strong suggestion of a dichorionic pregnancy; it can also serve to determine the chorionicity of any number of multiple pregnancies. However, the geometry of fused placentas, when multiple, can be complex and difficult to assess sonographically (1,5). A twin peak between two fetuses can infer only the chorionicity of this pair. Other US criteria of dichorionicity include the demonstration of anatomically separate placentas and identification of a thick intertwin membrane (6,7). The two amniotic and two chorionic layers separating the two

Index terms:

Fetus, US, 857.12981
Placenta, 857.824
Signs in Imaging
Twins, 857.1312

Radiology 2001; 220:68–69

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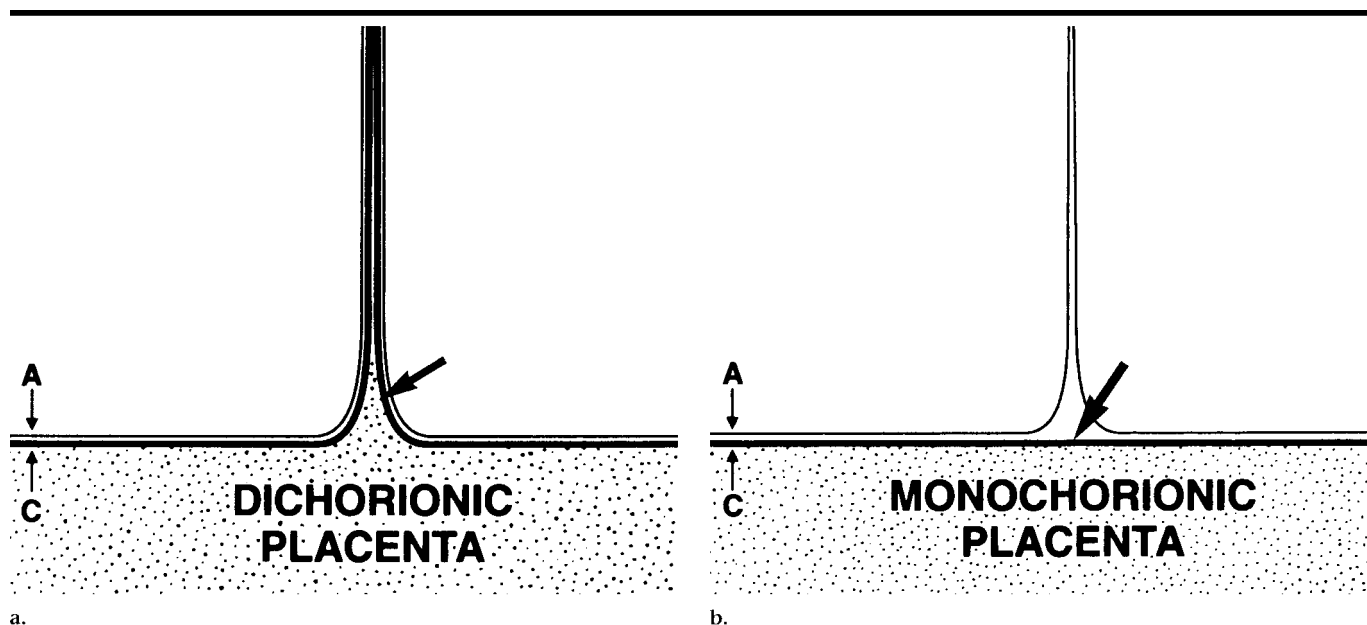


Figure 2. Drawing illustrates how the twin peak sign is reliable evidence of dichorionicity. (a) In a dichorionic pregnancy, both the amnions and the chorions reflect away from the placental surface, creating a potential space into which villi can grow. Large arrow shows the resulting twin peak sign. (b) Monochorionic diamniotic pregnancies have a single layer of continuous chorion (large arrow) limiting villous growth; the apposed amnions form a thin membrane separating the two amniotic cavities. A = amnion, C = chorion. (Reprinted, with permission, from reference 1.)

gestational sacs in a dichorionic gestation compose a thick membrane, which is often hyperechoic and reflective. Monochorionic pregnancies have a thin wispy membrane between the sacs made up of two layers of amnion and generally less than 1 mm in thickness (6,7).

Wood et al (8) conducted a prospective study to evaluate the diagnostic ability of the twin peak sign in assessing dichorionicity. Forty-five twin pairs were examined, of which 36 were dichorionic. They found that optimal evaluation was performed in the second trimester of gestation. In this subgroup, sensitivity and specificity were 100% and 86%, respectively, with positive predictive values for dichorionicity and monochorionicity of 97% and 100%, respectively. When third-trimester scans were included in the calculations these numbers decreased slightly with positive predictive values of 97% for dichorionicity and 78% for monochorionicity. Overall, the identification of a twin peak at any stage of pregnancy can be considered strong evidence of dichorionicity. However, as gestational age advances, crowding and shadowing from fetal body parts can limit the recognition of a twin peak. Furthermore, some researchers (9) have reported natural regression of chorion laeve throughout gestation so that the twin peak may actually regress in size with time.

Prenatal diagnosis of chorionicity is important because monochorionic pregnancies have increased rates and severity of all types of obstetric complications when compared with dichorionic pregnancies. The vascular communications between the fetuses through the unique placenta put these pregnancies at risk for twin-twin transfusion syndrome, twin em-

bolization syndrome, and acardiac parabiotic twin syndrome (3). Determining that a pregnancy is dichorionic will allow selective intervention for a malformed or otherwise abnormal fetus without harming the healthy fetus.

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