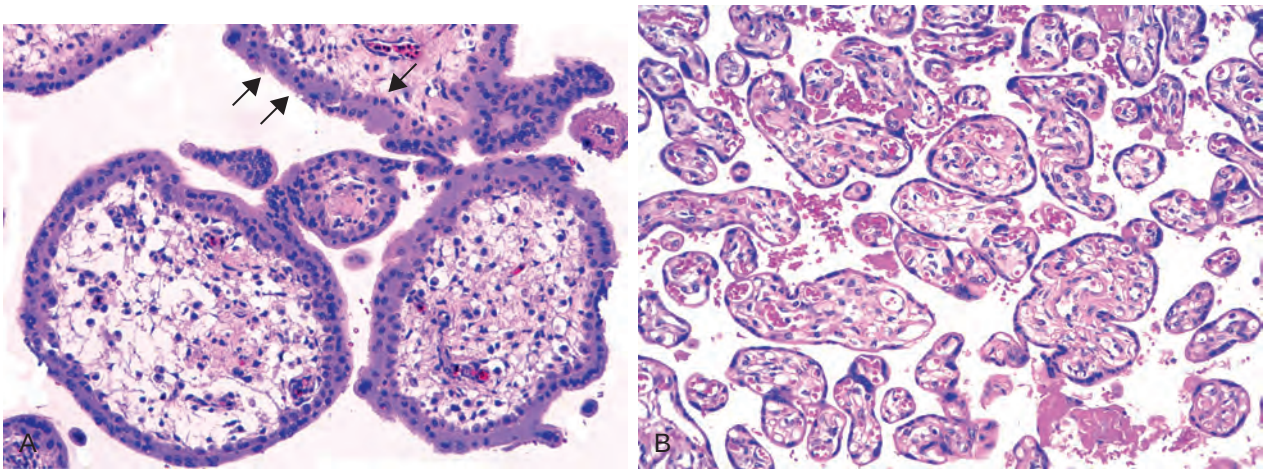

Figure 22-46 Normal placenta. **A,** First-trimester chorionic villi composed of delicate mesh of central stroma surrounded by two discrete layers of epithelium—the outer layer consisting of syncytiotrophoblast *(two arrows)* and the inner layer consisting of cytotrophoblast *(arrow)*. **B,** Third-trimester chorionic villi composed of stroma with dense network of dilated capillaries surrounded by markedly thinned-out syncytiotrophoblast and cytotrophoblast (same magnification as **A.**)

villi. In the chorionic villi they form an extensive capillary system, bringing fetal blood in close proximity to maternal blood. The gas and nutrient diffusion occurs through the villous capillary endothelial cells and thinned-out syncytiotrophoblast and cytotrophoblast. Under normal circumstances there little or no mixing between the fetal and maternal blood, though sufficient free fetal DNA reaches the maternal circulation to permit prenatal genetic testing (Chapter 5). Blood oxygenated in the placenta returns to the fetus through the single umbilical vein.

Disorders of Early Pregnancy

Spontaneous Abortion

Spontaneous abortion, or "miscarriage," is defined as pregnancy loss before 20 weeks of gestation. Most of these occur before 12 weeks. Ten to fifteen percent of clinically recognized pregnancies terminate in spontaneous abortion. However, using sensitive chorionic gonadotropin

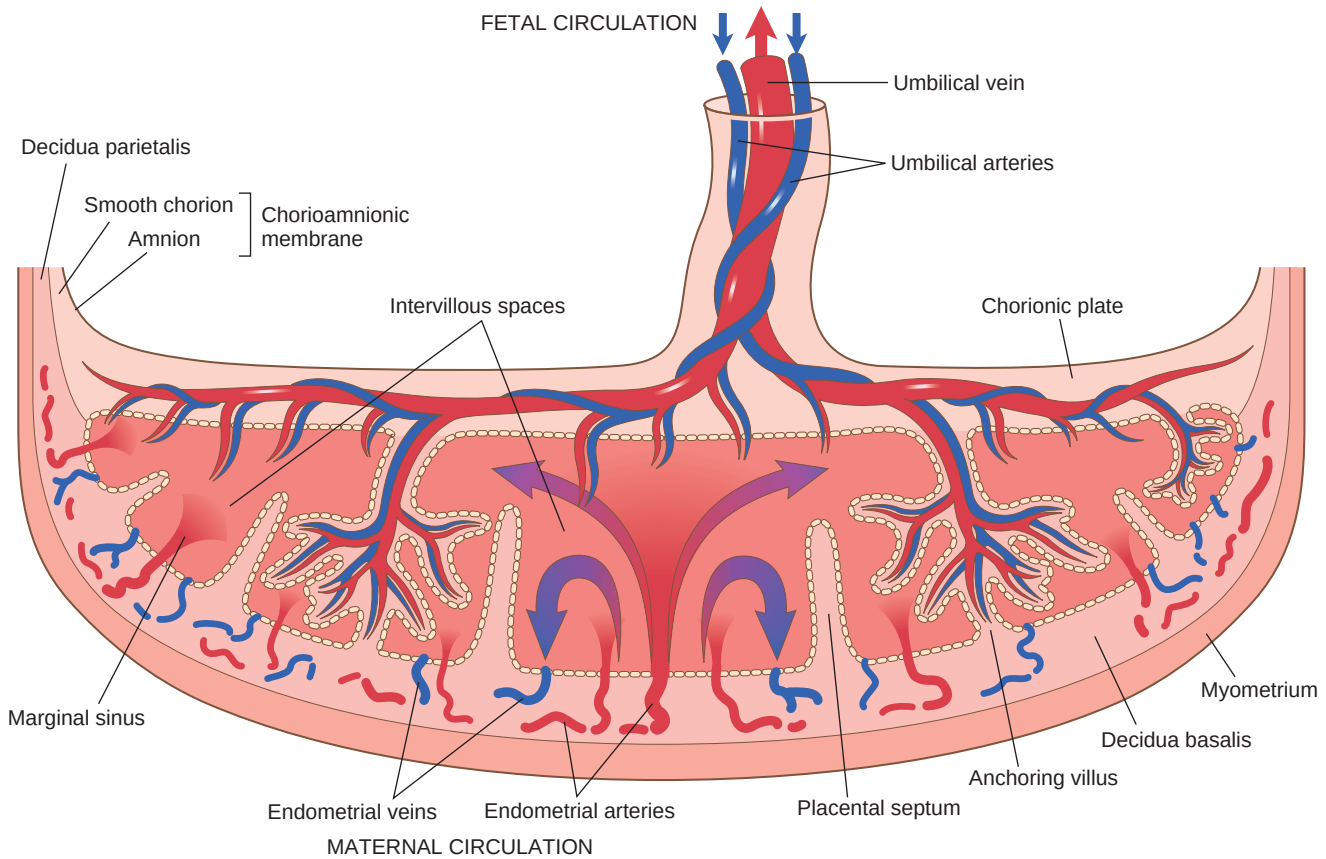

Figure 22-47 Diagram of placental anatomy. Within the outer boundary of myometrium is a layer of decidua, from which the maternal vessels originate and deliver blood to and from the intervillous spaces. Umbilical vessels branch and terminate in placental villi, where nutrient exchange takes place.