

## **Uterine artery Doppler for abnormal placental shape and/or increased placental thickness**

The placental position and possibly gestational age need to be considered when determining placental thickness. Anterior placentas are approximately 7 mm thinner than posterior or fundal placentas. Anterior placentas of greater than 33 mm and posterior placentas of greater than 40 mm should be considered abnormally thick.

\*Lee. J Ultrasound Med. 2012 Feb;31(2):213-8.

Abnormal placental shape is a consequence of maldevelopment of the maternal vascular supply / impaired placentation process necessitating uterine artery Doppler to complete and optimize risk assessment for placenta-related adverse obstetrical outcomes.

Thick placentas are sometimes referred to as "hyperinflated" due to expansion of the intervillous space from the histopathologic findings of chorion regression and distal villous hypoplasia. Chorion regression refers to histopathologic loss of anchoring villi needed to contain normal placental shape.

\*Placental hyperinflation and the risk of adverse perinatal outcome. Porat. Ultrasound Obstet Gynecol 2013 Sep;42(3):315-21. doi: 10.1002/uog.12386.

In high risk pregnancies with bilateral abnormal uterine artery doppler, abnormal placental shape (thickness / length ratio > 0.50 or thickness > 4 cm) increases the odds of early onset fetal growth restriction (OR, 4.7.)

\* Toal. Determinants of adverse perinatal outcomes in high-risk women with abnormal uterine artery Doppler images. Am J Obstet Gynecol 2008; 198:330.e1-7.

\* Kingdom. Feb 2018 AJOG. A placenta clinical approach to the diagnosis and management of fetal growth restriction.

\* Scazzocchio. Ultrasound Obstet Gynecol 2017; 49:435 - 441. Uterine artery Doppler is a validated non-invasive proxy for placenta ischemia due to defective trophoblastic invasion.

Differential diagnosis for a thick placenta with normal uterine artery Doppler includes nonpathologic extreme of normal variants; functionally inefficient - contributing to less than expected growth potential; infection; placental mosaicism; and placental histopathologies that have not yet reached Doppler detectable hemodynamic alterations in placental impedance.

Sonographically thick placentas have been reported to be associated with increased perinatal risk related to fetal anomalies and higher rates of SGA and LGA birth weights.

\*Elchalal. Sonographically thick placenta: a marker for increased perinatal risk. Placenta. March 2000

\_the incidence of perinatal mortality was significantly higher among gravidae with thick placentae (6.82% versus 0.66%). Birthweight at term was found to be above 4000g in 20% of the thick-placenta group as compared to 5% in the control group and birthweight of less than 2500 g was found in 16% of the thick-placenta group as compared to 7% in the control group. The incidence of fetal anomalies was 9.1 per cent in the thick-placenta group and 3.97 per cent in the control group (not significant).

