



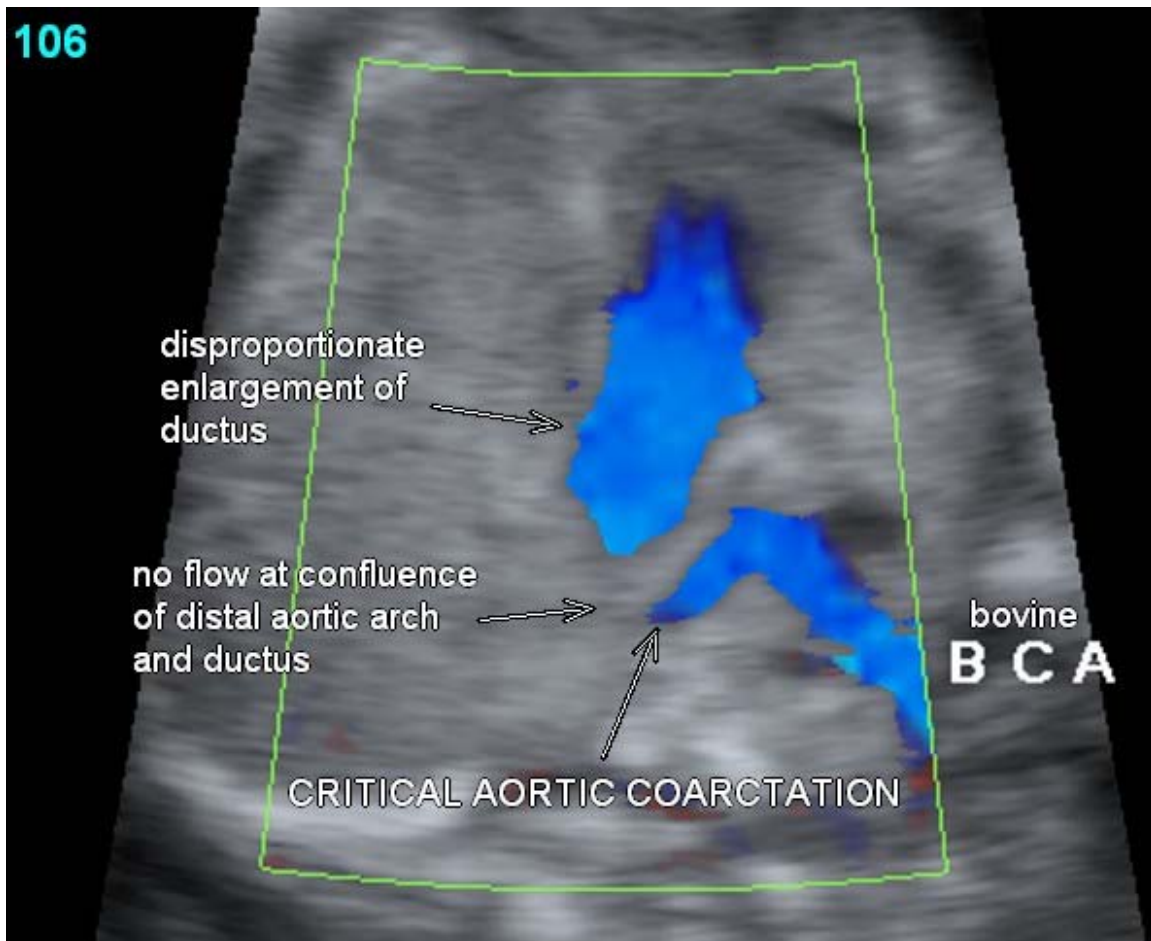
CASE STUDY – Antenatal Diagnoses of Critical Fetal Aortic Coarctation with Utero-Placental Vascular Insufficiency

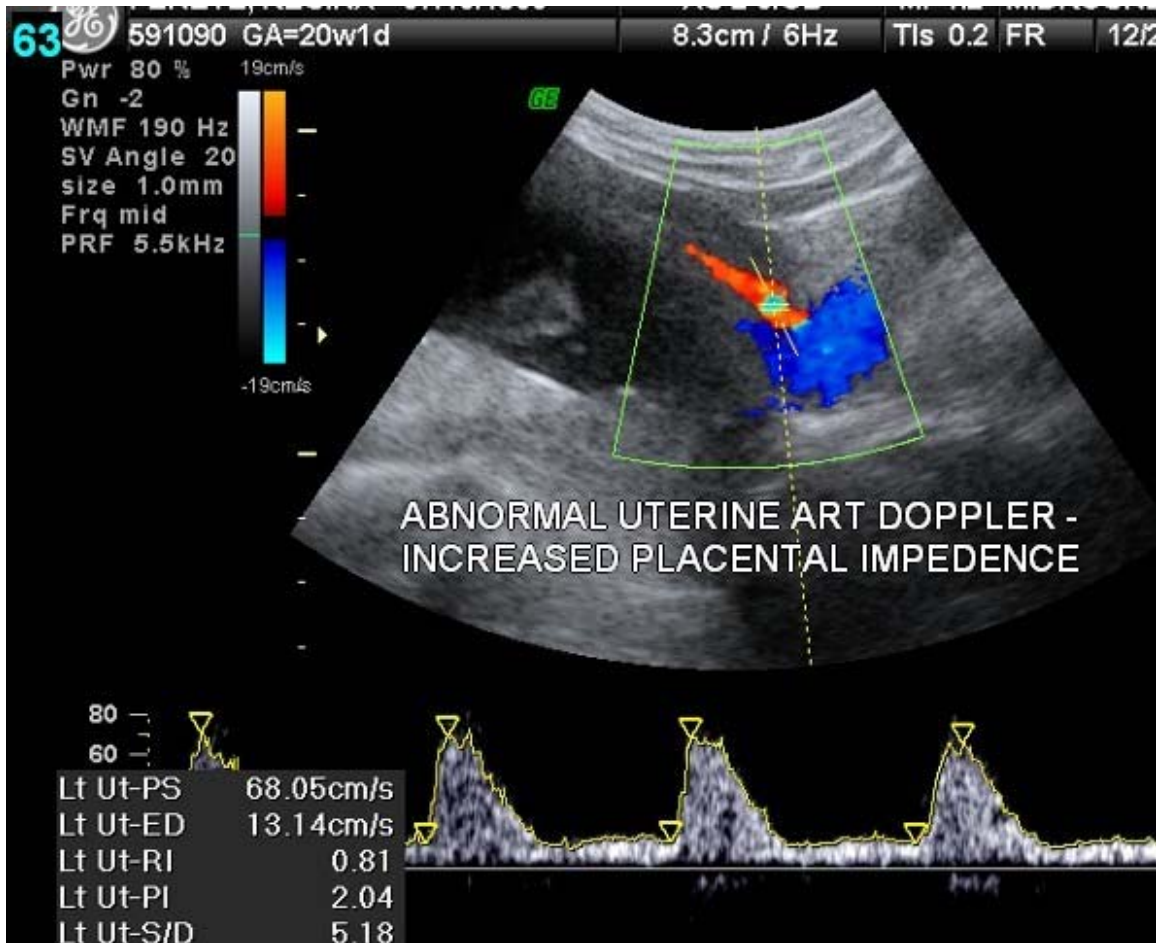
CASE HISTORY: 26-year-old unscreened patient who presents at 20 weeks for her “routine” anatomy scan. The patient has a past obstetrical history of pre-term labor and full-term birth of an IUGR neonate.

A severe aortic coarctation was identified in a fetus that otherwise demonstrated normal four-chamber heart and outflow tracts as defined by accrediting organizations and no extracardiac malformations.

Given past obstetrical history the patient is at increased risk for recurrent uteroplacental vascular insufficiency (UPVI). Maternal uterine artery Doppler demonstrated significant increased placental impedance conferring increased risk for recurrent UPVI additive to the risk conferred by past obstetrical history.

Antenatal obstetrical care: Because of the severe aortic coarctation, antenatal obstetrical care was transferred to a tertiary care center. Patient had pre-term labor with normal spontaneous vaginal delivery at 37 weeks of an IUGR neonate at less than the 5th percentile in weight (2125 grams). Post-natal evaluation confirmed the presence of a severe aortic coarctation in a euploid newborn with no other malformations. Surgery occurred on day 8 of life with resection of the stenotic segment and an extended end-to-end anastomosis.





What was HVRA's unique contribution to the management of this case?

- As fetal cardiac imaging specialists in conjunction with our unique cardiovascular protocols (exceeding national guidelines and employed during all 18-22 week anatomy scans) our interpretive expertise diagnosed a severe aortic coarctation in the presence of normal four-chamber cardiac and normal level II cardiac outflow tract views. This neonate would have precipitously deteriorated shortly after birth if not for our antenatal diagnosis. HVRA's commitment to cardiovascular diagnosis has demonstrated an 80 to 90% detection rate of congenital heart disease during standard anatomy scan in comparison to the national detection rate of 15 to 30%.
- HVRA's unique practice style of obtaining a detailed obstetrical history identifying risk factors for UPVI prompted performance of maternal uterine artery Doppler. Increased placental impedance correctly predicted recurrent preterm delivery of a growth-restricted fetus. Uterine artery Doppler when applied to multiparous patients with past obstetrical history of any of the following clinical expressions of UPVI - PTD <36 weeks, early preeclampsia, IUGR, abruption, stillbirth, and NICU admission - has the following predictive values: 80% sensitivity, specificity 90%, positive predictive value 70% and negative predictive value 93%. Harrington. US Ob Gyn. 2004. Sciscione. Am J Ob Gyn. 2009.
- In a patient referred to us for "routine" imaging HVRA's unique practice style identified fetal and maternal pathology that could have been a potential medical and legal disaster if delivered at a community hospital.



HUDSON VALLEY RADIOLOGY ASSOCIATES

What makes HVRA's maternal fetal obstetrical imaging program unique?

- Detailed obstetrical history driven ultrasound protocols optimize detection
 - fetal cardiac and noncardiac malformations
 - aneuploidy screening
 - uteroplacental vascular insufficiency
 - fetal, neonatal and maternal well-being.
- Minimize obstetrical malpractice exposure.
- Pregnancy Outcome Quality Assurance Program

FAST FACTS ON FETAL CONGENITAL HEART DISEASE (CHD)

- Incidence, 1:200 – 1:300 pregnancies with the profound majority having no risk factors
- CHD is the most common, the most serious and nationally the most frequently missed of all fetal malformations
- Current detailed/level II accreditation guidelines have not improved the 15-30% national detection rate of fetal CHD. This failure acknowledges that “it is not the mere performance of ‘outflow tract’ imaging but the detailed knowledge of fetal cardiac pathology, its recognition and the interpretive expertise that is necessary to substantially increase detection rate of CHD.”
- CHD is the malformation most responsible for infant morbidity and mortality accounting for greater than one-third of infant deaths related to congenital malformation.
- Without a prenatal diagnosis, even severe forms of congenital heart disease commonly go undetected until after discharge to home leading to avoidable morbidity and mortality.
- 20-55% of infants with CHD are not diagnosed until after hospital discharge. Most obstructive left heart lesions (such as aortic coarctation) are not diagnosed at birth or at six weeks.
- Aortic coarctation is one of the three undiagnosed conditions (the others are hypoplastic left heart and interrupted arch) most likely to lead to death soon after discharge from hospital.

Prenatal Detection of Congenital Heart Disease in Southern Nevada, The Need for Universal Cardiac Evaluation. J. Ultrasound in Medicine, 26:1715-1719.

Prenatal Screening of Major Congenital Heart Disease. J. Ultrasound in Medicine, 28: 889-899.