— A notch is an early diastolic dip. In the second half of pregnancy this is evidence for an abnormal pulse wave reflection at the level of the spiral aa., presumably because of a faulty trophoblast invasion (Figs. 3.16, 3.17).

— Altered Doppler parameters are less important in predicting pregnancy risks than the demonstration of notching, which in 70% of cases is considered to be the determining sign of developing preeclampsia or of a pregnancy-induced hypertension (PIH).

Fig. 3.12 Color display of the course of the uterine a. by Doppler spectrum. Normal examination. Note that the uterine a. is usually located under the skin close to the transducer.

Fig. 3.13 Normal display of a uterine a.

Fig. 3.14 Color display of the uterine a. Normal Doppler examination.

Fig. 3.15 Transvaginal display of the uterine a. by color Doppler and gray-scale Doppler with notch. This can be normal early in pregnancy.

Fig. 3.16 Uterine a. with notch.

Fig. 3.17 Color display of the course of the uterine a. and of an abnormal flow profile with notch.
Fig. 3.21  Schematic diagram showing the examination of the fetal aorta. The aorta is first found as a cross-sectional image at the level of the kidneys and interrogated avoiding the vertebral column. The transducer is then turned along the aorta to display it longitudinally. To achieve an optimal Doppler angle for the examination of the aorta distal to the origins of the renal arteries, the transducer is moved toward the infant’s head and tilted toward the infant’s coccyx.

► Risk estimate using the RI in the aorta:
RI <80 %: Not significant
RI 81–85 %: Borderline finding
RI 86–95 %: Abnormal finding
RI 96–100 %: Highly abnormal finding

► Advantages of examining the fetal aorta: The resistance of the placental vascular bed can be examined, since the origin of the umbilical a. is immediately adjacent. Conclusions can be drawn regarding the condition of the fetal peripheral bed as well as the fetal response to pathological changes. The vessel can be examined without any problems in multiple pregnancies.

Fig. 3.22  Display of the aortic arch and the waveform at the aortic arch. This is not the place to examine the aorta to determine the condition of the fetus.

Fig. 3.23a  Color Doppler ultrasound display of the aorta with bifurcation into the iliac aa.

Fig. 3.23b  Display of the aorta with forward flow and the inferior vena cava with reverse flow.
5—Patient with Antiphospholipid-Antibody Syndrome

Fig. 19.6a–d  Doppler ultrasound readings through the course of pregnancy.

a  RI of the UA.
b  RI of the MCA.
c  Placental–cerebral ratio (PCR) (RI umbilical a./RI middle cerebral a.)
d  RI of the uterine a. (UT).

Fig. 19.7a–e  Doppler sonographic display of the right uterine a. through the course of pregnancy: PI values tend to increase, notch intensity increases, an additional (double notch) systolic notch appears as the pregnancy progresses.

a  Gestational age: 22 weeks 5 days, minimal postsystolic notch, PI: 1.05.
b  Gestational age: 25 weeks 0 days, minimal postsystolic notch, PI: 1.22.
c  Gestational age: 27 weeks 2 days, minimal postsystolic notch, PI: 1.53, systolic notch (double notch).
d  Gestational age: 32 weeks 3 days, minimal postsystolic notch, PI: 1.30, systolic notch.
e  Gestational age: 33 weeks 3 days, very marked postsystolic notch, PI 1.45, systolic notch.