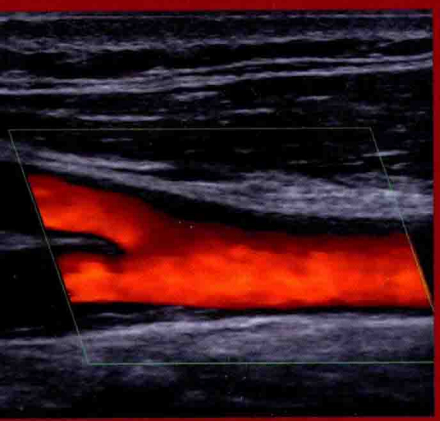
Clinical Guide to Sonography

Exercises for Critical Thinking

Charlotte Henningsen
Kathryn Kuntz
Diane Youngs



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With a foreword by
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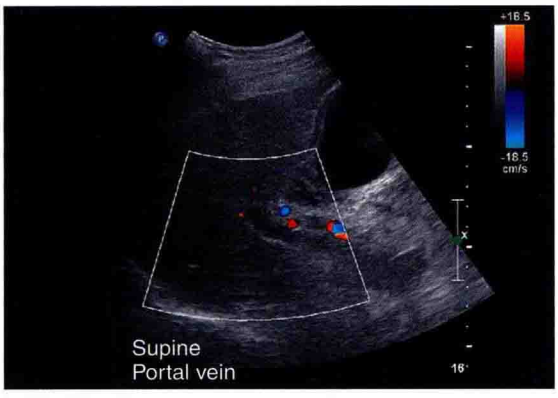
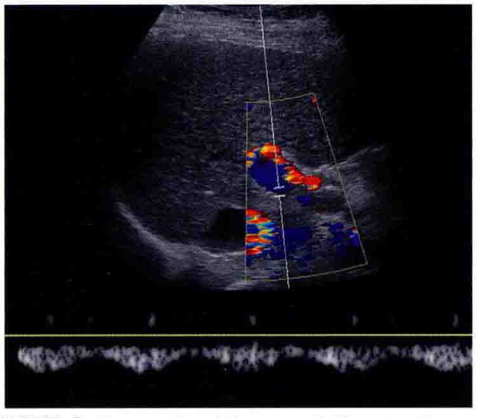
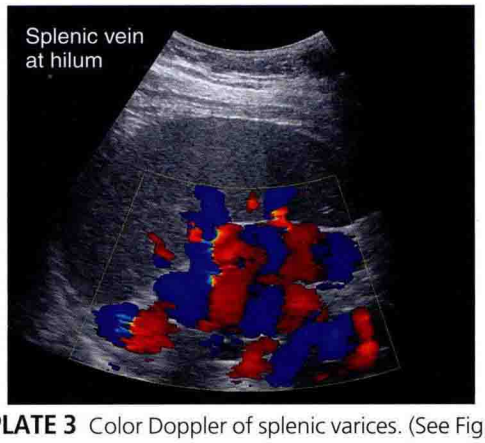


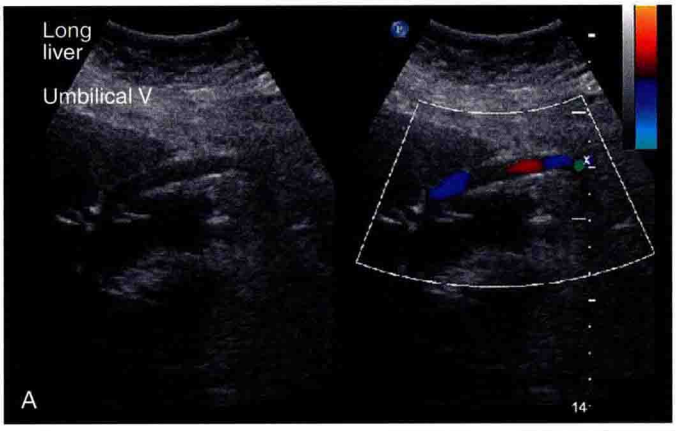
COLOR PLATE 1 Absence of flow within the portal vein. (See Fig. 3-3.)

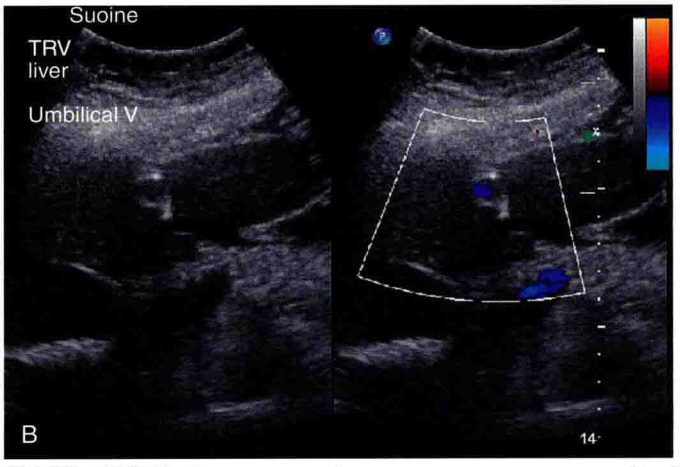


COLOR PLATE 2 Hepatofugal (reversed) flow in the main portal vein. (See Fig. 3-6, *B.*)

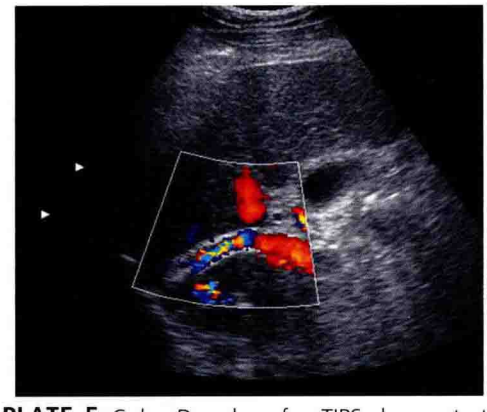


COLOR PLATE 3 Color Doppler of splenic varices. (See Fig. 3-15, *B.*)



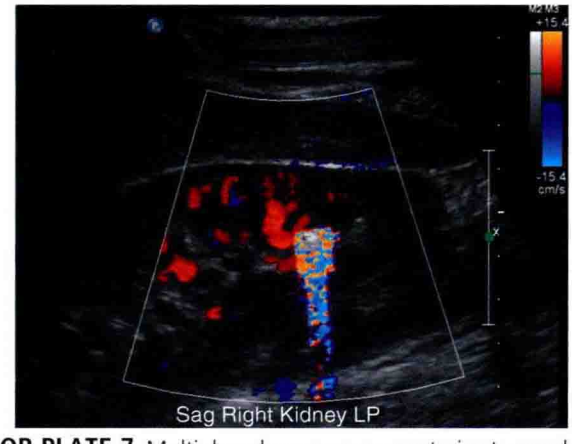


COLOR PLATE 4 A, Longitudinal image. Patent, recanalized umbilical vein. **B,** Transverse image. Patent umbilical vein in the ligament of teres. (See Fig. 3-17).

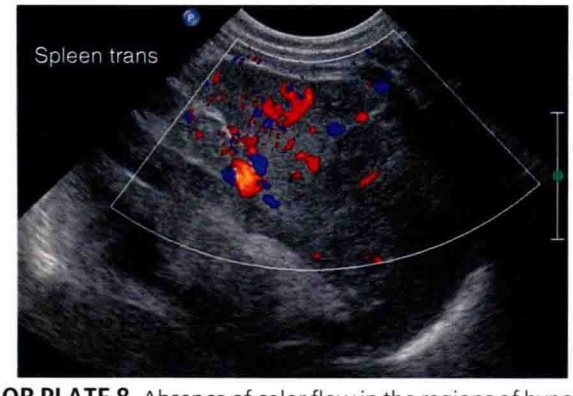


COLOR PLATE 5 Color Doppler of a TIPS demonstrating blood flow toward the IVC. (See Fig. 3-19, *B.*)

COLOR PLATE 6 Transverse midline image. (See Fig. 3-25.)

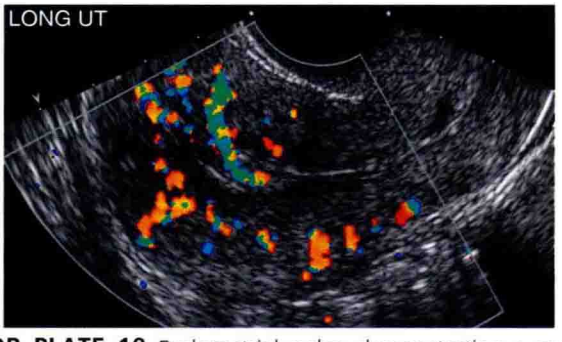


COLOR PLATE 7 Multiple colors are seen posterior to renal stone ("twinkle" sign). (See Fig. 5-6, *B.*) *(Courtesy Aubrey Rybyinski, BS, RDMS, RVT, Department of Radiology Ultrasound Section, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania.)*

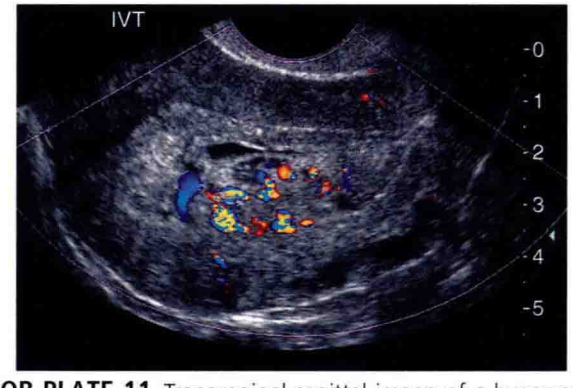


COLOR PLATE 8 Absence of color flow in the regions of hypoechogenicity. (See Fig. 8-1, *C.*)

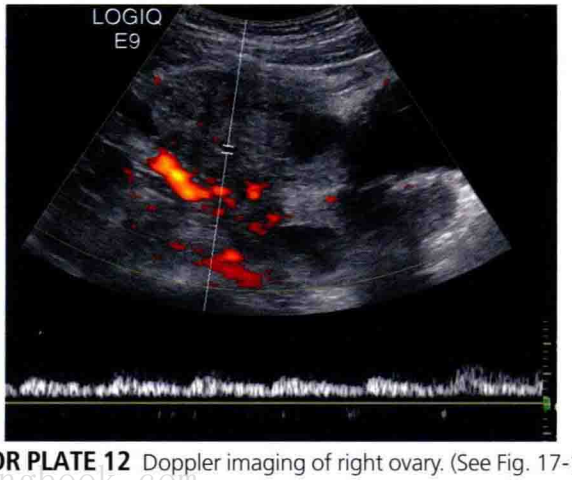
COLOR PLATE 9 Gynecologist removing endometrial polyp during hysterectomy. (See Fig. 13-23.)



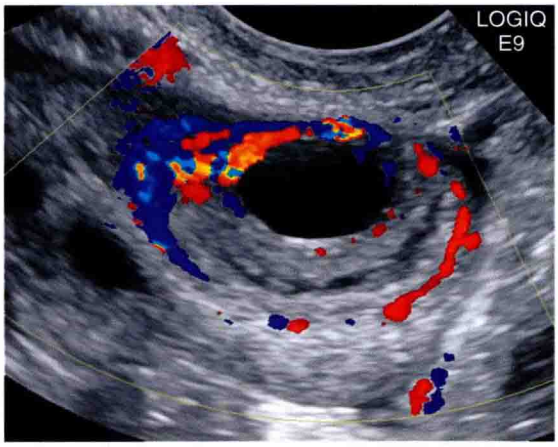
COLOR PLATE 10 Endometrial polyp demonstrating a vascular feeding stalk. (See Fig. 13-28.)



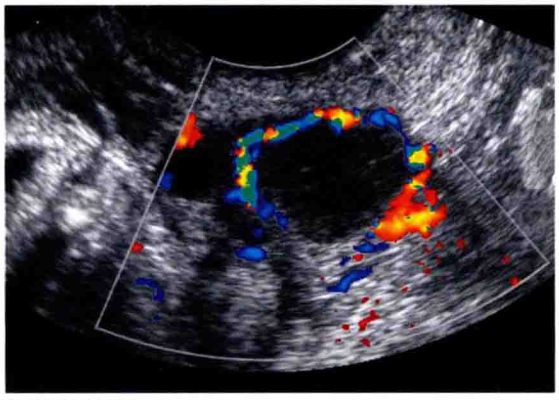
COLOR PLATE 11 Transvaginal sagittal image of a hypervascular uterus with a thick endometrium. (See Fig.14-9, *A.*)



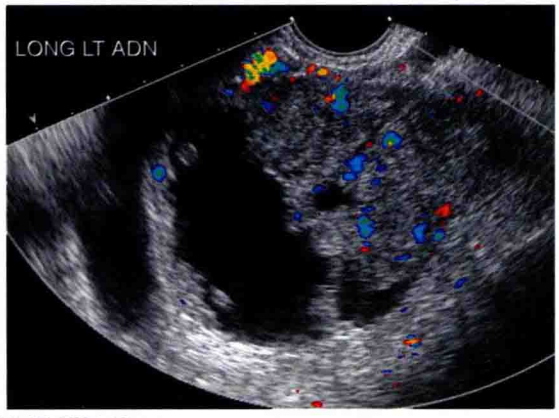
COLOR PLATE 12 Doppler imaging of right ovary. (See Fig. 17-1, *B.*)



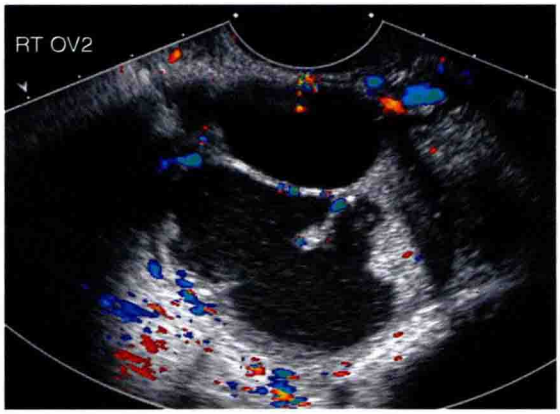
COLOR PLATE 13 Color Doppler image demonstrating flow around the highly vascular corpus luteum. (See Fig. 17-3, *C*.)



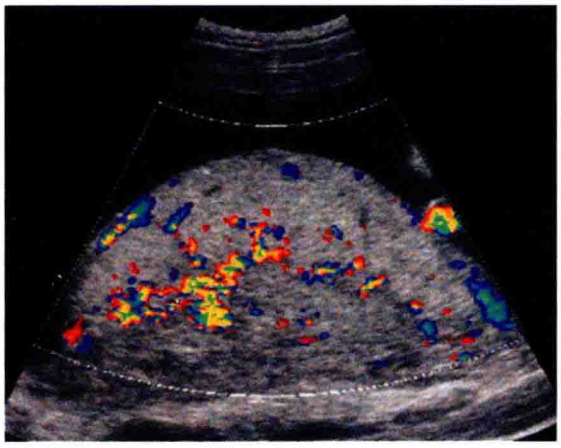
COLOR PLATE 14 Hemorrhagic cyst with peripheral flow shown on color Doppler imaging. (See Fig. 17-6.)



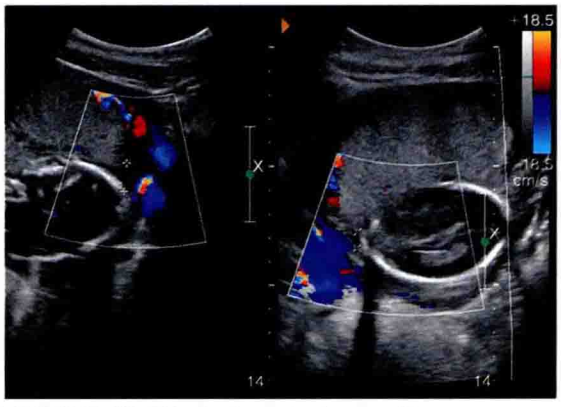
COLOR PLATE 15 Serous cystadenocarcinoma measuring 9.0 cm, demonstrating a solid component with internal vascularity evident on color Doppler imaging. (See Fig. 17-14.)



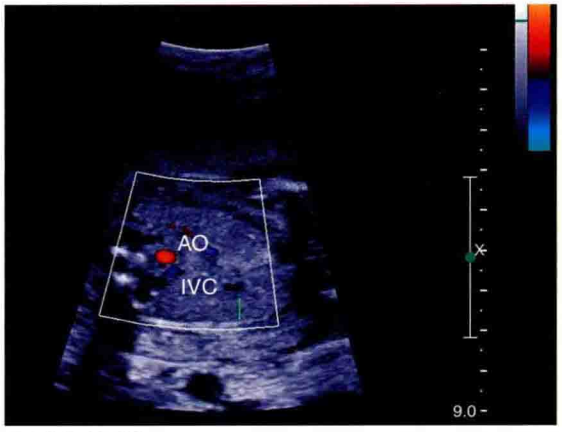
COLOR PLATE 16 Adnexal mass in a 60-year-old patient with increased CA 125. (See Fig. 17-24, *B*.)



COLOR PLATE 17 Enlarged placenta. (See Fig. 19-1.)

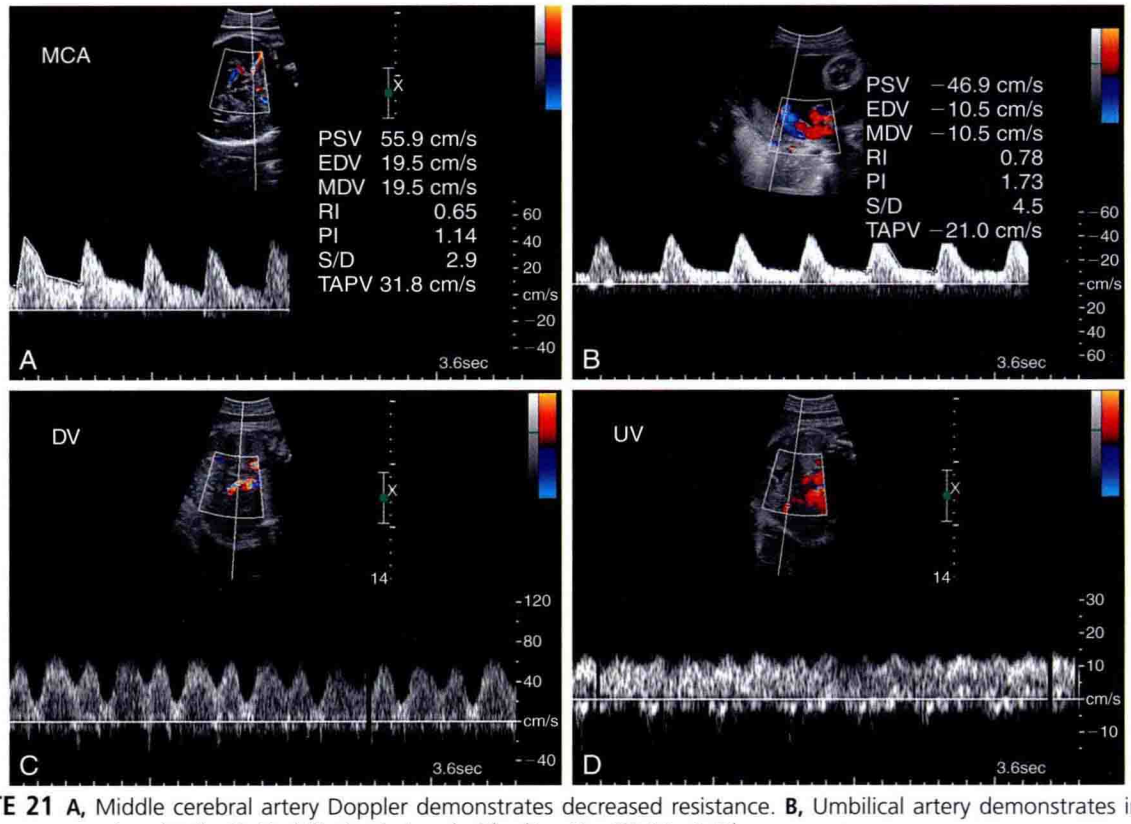


COLOR PLATE 18 Oligohydramnios is noted in a pregnancy at 19 weeks' gestational age. Only 1.9 cm of fluid is noted around the fetus. Color Doppler imaging helps identify the umbilical cord. (See Fig. 20-2.)

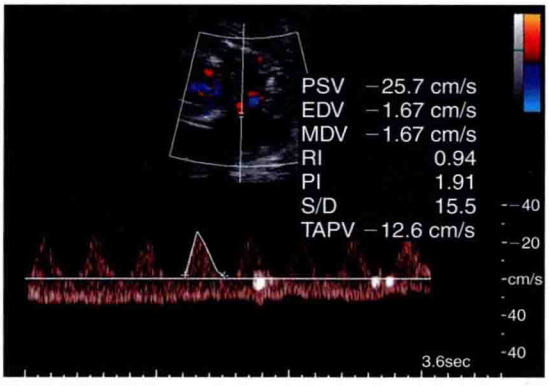


COLOR PLATE 19 Renal agenesis was confirmed in this breech fetus with severe oligohydramnios. Neither bladder nor renal arteries were identified. (See Fig. 20-3, *A*.)

COLOR PLATE 20 Normal renal arteries are apparent. Color Doppler maps out renal arteries bilaterally in a growth-restricted fetus with oligohydramnios, confirming the presence of kidneys that are poorly visualized. (See Fig 20-3, *C*.)

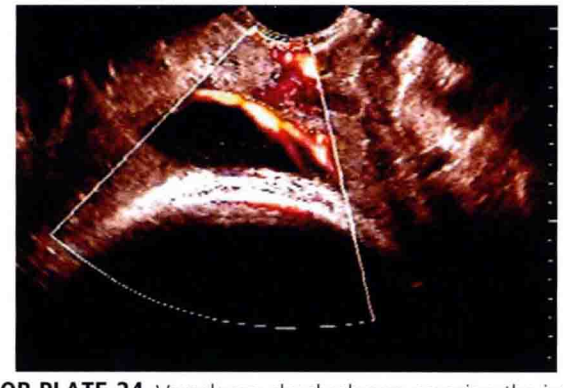


COLOR PLATE 21 **A,** Middle cerebral artery Doppler demonstrates decreased resistance. **B,** Umbilical artery demonstrates increased resistance. **C,** Ductus venosus is pulsatile. **D,** Umbilical vein is pulsatile. (See Fig. 20-10, *A-D*.)

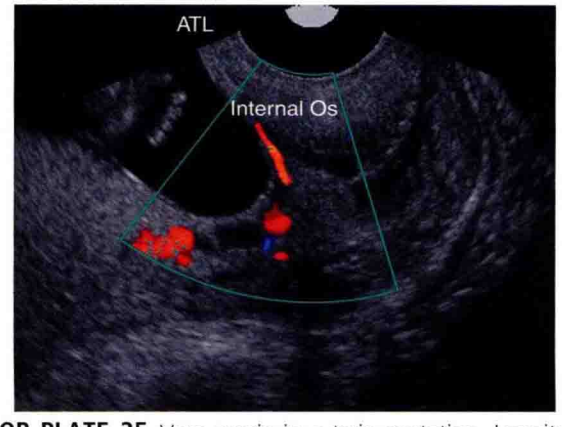


COLOR PLATE 22 Abnormal umbilical artery Doppler is demonstrated. (See Fig. 20-11, *B*.)

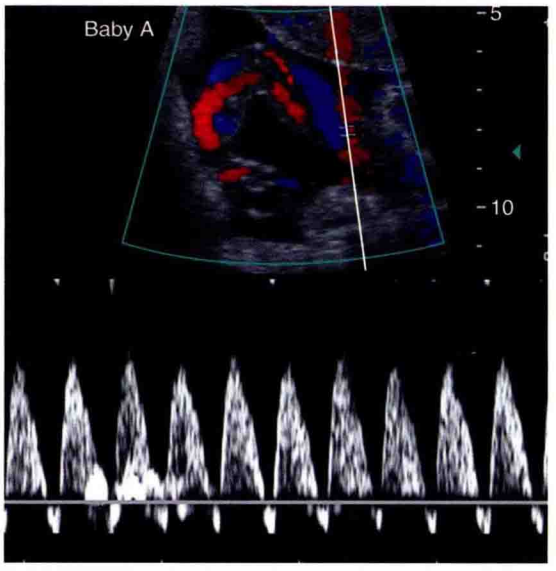
COLOR PLATE 23 Hyperechoic left kidney with no discernible blood flow. (See Fig. 20-12, *A-C*.)



COLOR PLATE 24 Vessels are clearly shown covering the internal os and are enhanced with power Doppler imaging. (See Fig. 21-8.)



COLOR PLATE 25 Vasa previa in a twin gestation. Longitudinal image at the level of the cervix with vessels coursing over the internal cervical os. (See Fig. 22-5.)

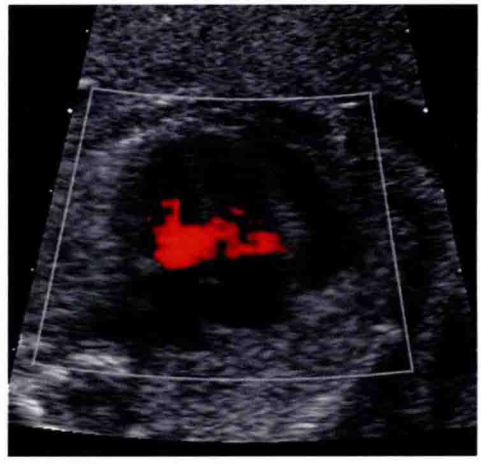


COLOR PLATE 26 Pulsed Doppler waveform of twin A's umbilical artery. (See Fig. 22-18.)

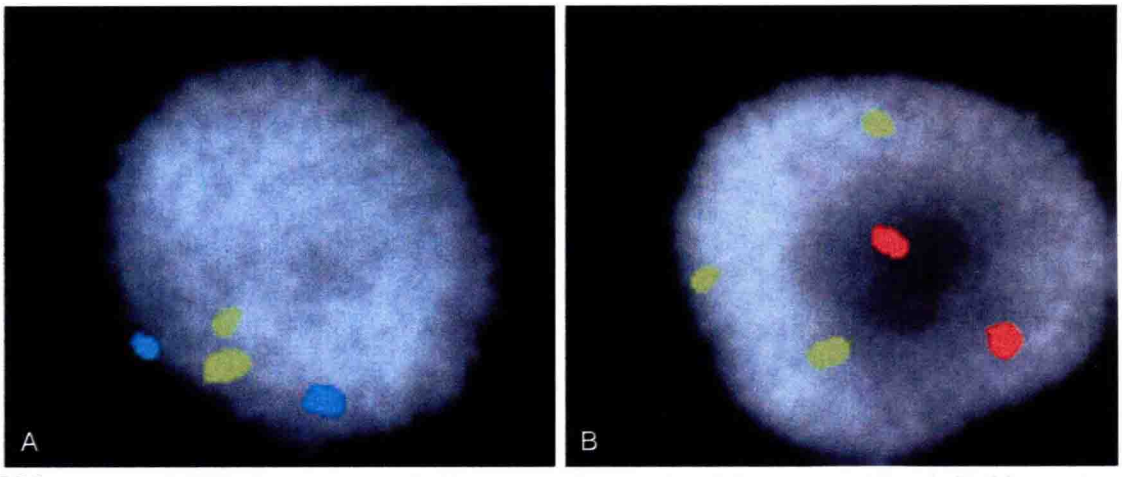
COLOR PLATE 27 Three-dimensional imaging demonstrates the gastroschisis. (See Fig. 23-6, *C*.)

COLOR PLATE 28 Three-dimensional imaging shows the umbilical cord inserting into the defect. The karyotype was normal. (See Fig. 23-7, *B*.)

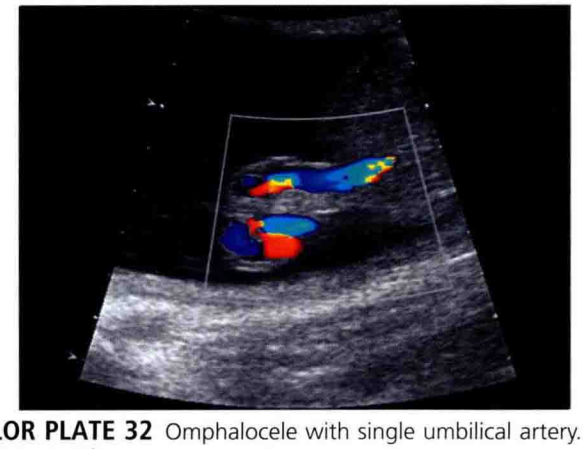
COLOR PLATE 29 Three-dimensional imaging further clarifies the anomaly. (See Fig.23-12, *B*.)



COLOR PLATE 30 Sonographic findings in a 25-week gestational age fetus. (See Fig. 24-1, *C*.)

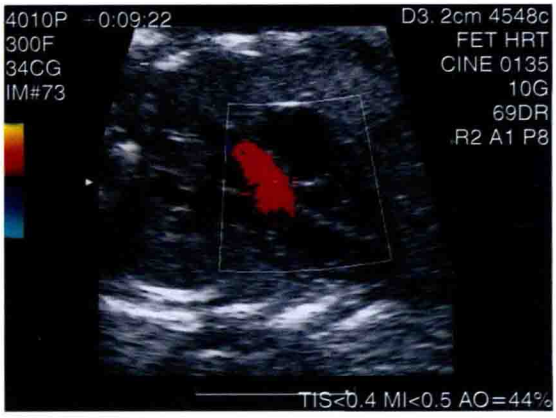


COLOR PLATE 31 **A,** Two copies of X chromosome coded in green and two copies of chromosome 18 coded in blue. **B,** Two copies of chromosome 21 are coded in red, and three copies of chromosome 13 are coded in green. (See Fig. 24-2, *B* and *C*.)

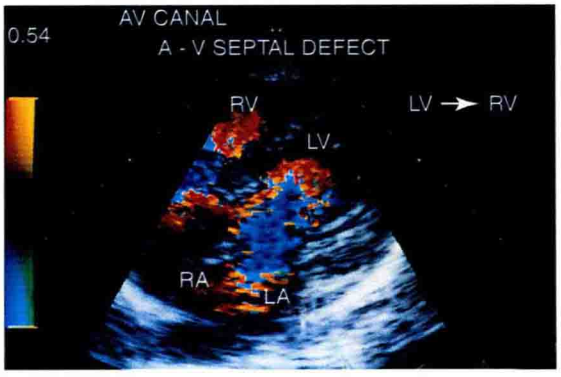


COLOR PLATE 32 Omphalocele with single umbilical artery. (See Fig. 24-13, *B*.)

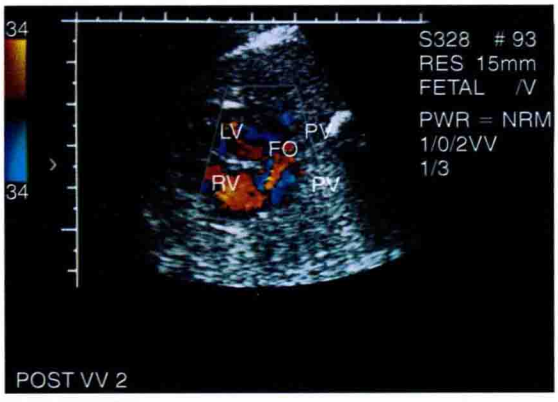
COLOR PLATE 33 The fetal situs is normal. Heart position is in the left chest, and the apex of the heart points to the left; stomach is to the left; aorta is anterior and to the left of the spine; and inferior vena cava is anterior and to the right of the spine. (See Fig. 26-1.)



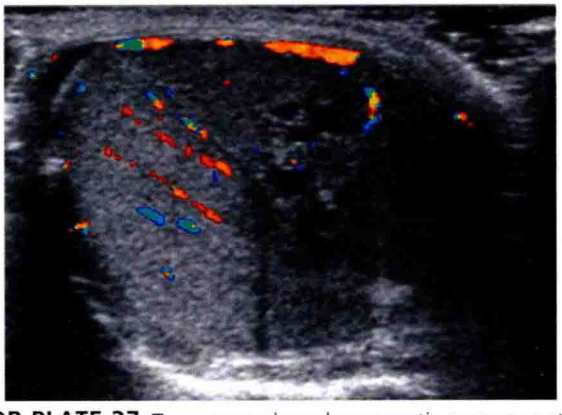
COLOR PLATE 34 Aortic outflow is shown in red in this four-chamber view. (See Fig. 26-7, *B*.)



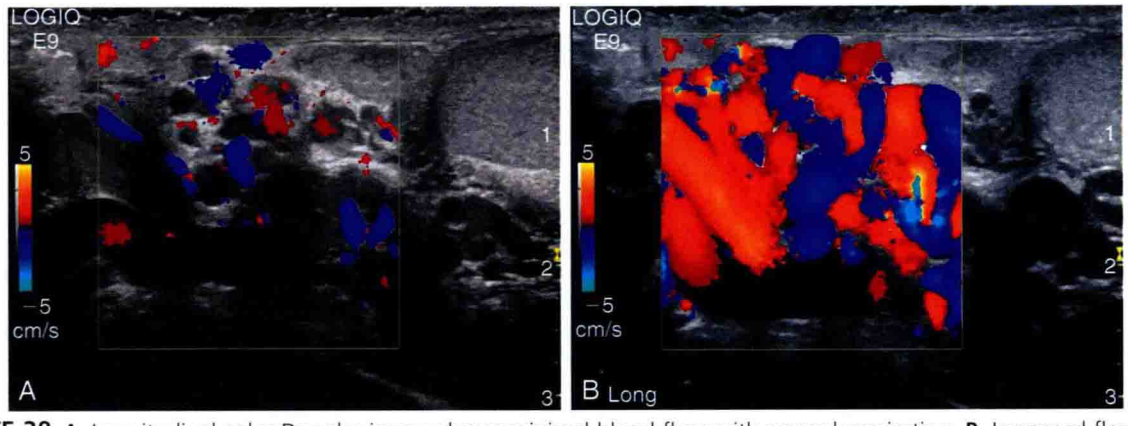
COLOR PLATE 36 Color flow imaging is helpful to map the flow across the defect and to track regurgitation into the atria. *LA,* Left atrium; *LV,* left ventricle; *RA,* right atrium; *RV,* right ventricle. (See Fig. 26-15, *C*.)



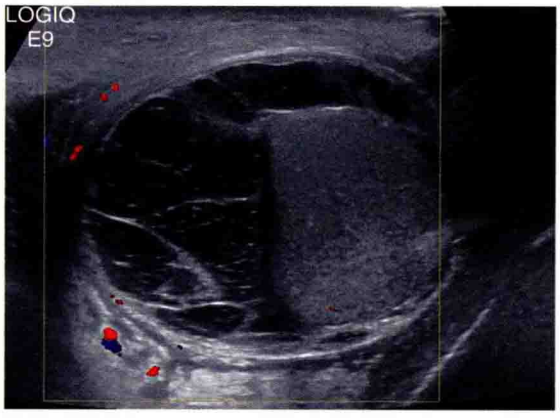
COLOR PLATE 35 In the fetus, normal flow should occur at the level of the foramen ovale *(FO)*. *PV,* Pulmonary vein. (See Fig. 26-9, *B*.)



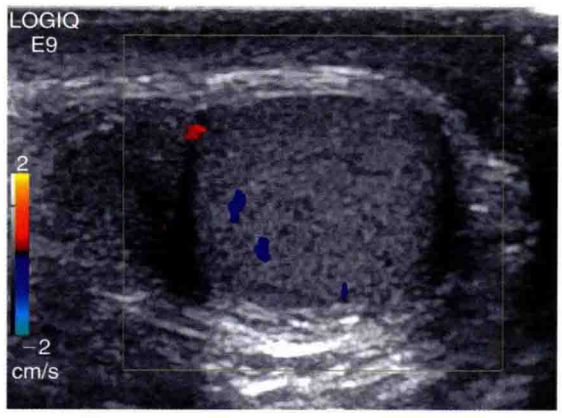
COLOR PLATE 37 Transverse view shows cystic components and internal blood flow. (See Fig. 28-1, *B*.)



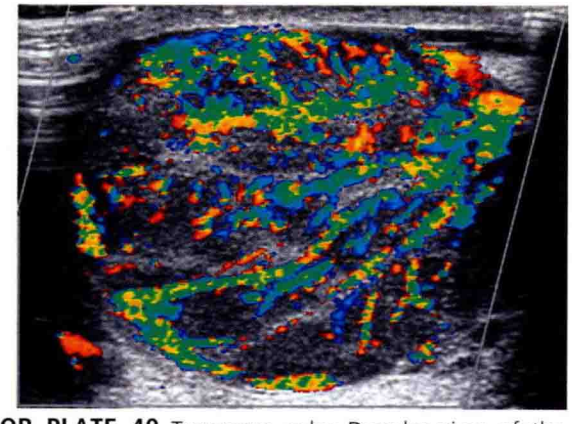
COLOR PLATE 38 **A,** Longitudinal color Doppler image shows minimal blood flow with normal respiration. **B,** Increased flow with Valsalva maneuver. (See Fig. 28-6, *B* and *C*.)



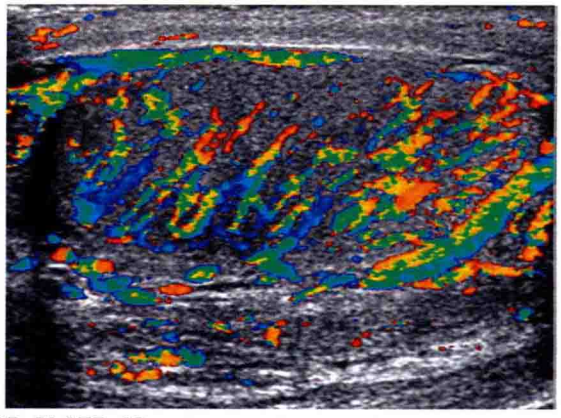
COLOR PLATE 39 Complex septate paratesticular collection in a man 13 days after vasectomy, which was a pyocele at surgical exploration. (See Fig. 28-7.)



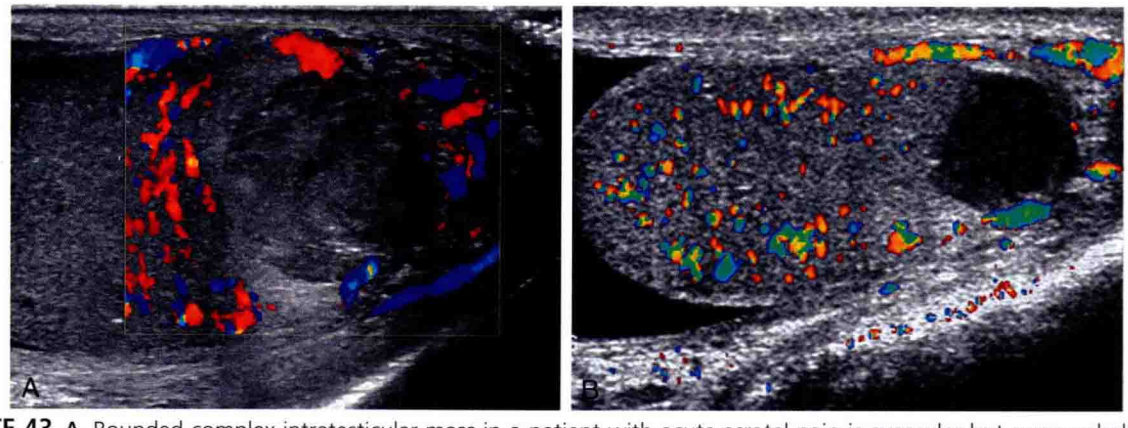
COLOR PLATE 41 An otherwise normal testis and epididymis seen in the inguinal canal of a 5-year-old boy. (See Fig. 28-18.)



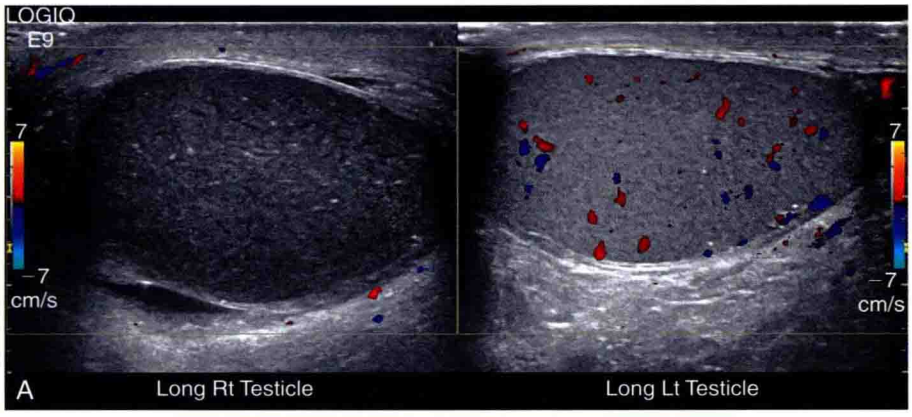
COLOR PLATE 40 Transverse color Doppler view of the same patient demonstrating the typical finding of undistorted vasculature. (See Fig. 28-17, *B*.)

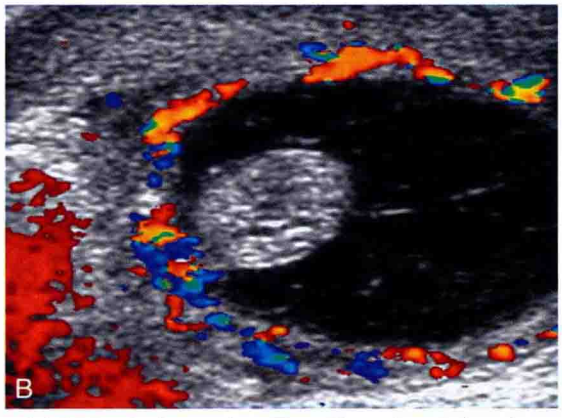


COLOR PLATE 42 Color Doppler image showing hyperemia of epididymo-orchitis, including in the scrotal skin. (See Fig. 28-20.)

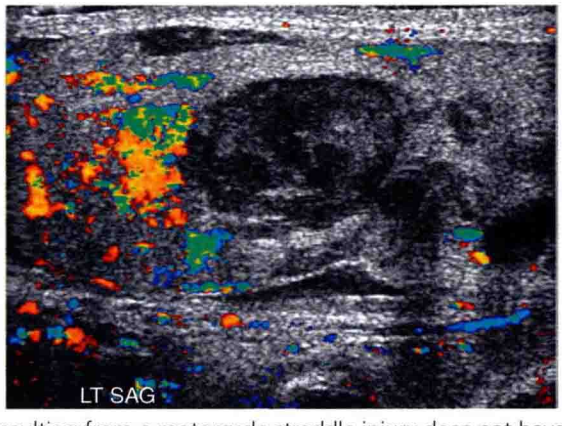


COLOR PLATE 43 **A,** Rounded complex intratesticular mass in a patient with acute scrotal pain is avascular but surrounded by hyperemia, suggesting epididymo-orchitis abscess instead of neoplasm. **B,** Follow-up examination 2 weeks later shows the mass to be shrinking and with continued avascularity, confirming the diagnosis. (See Fig. 28-21.)

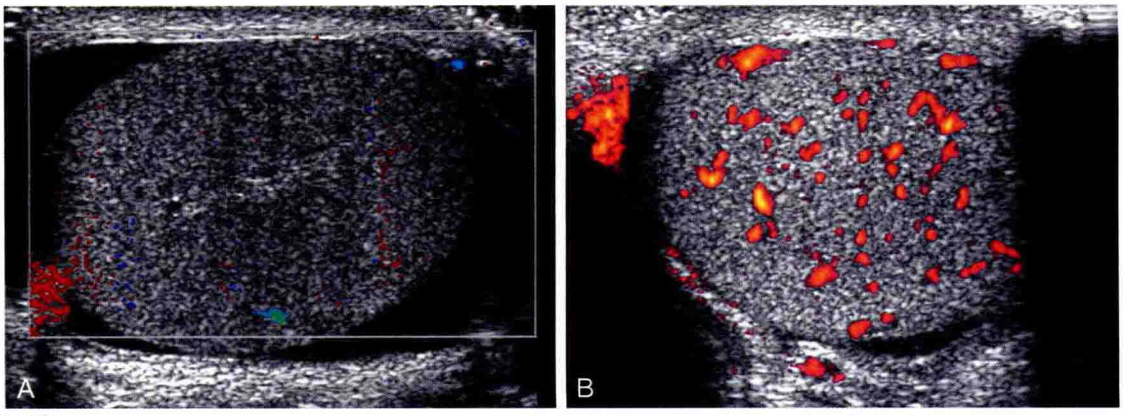




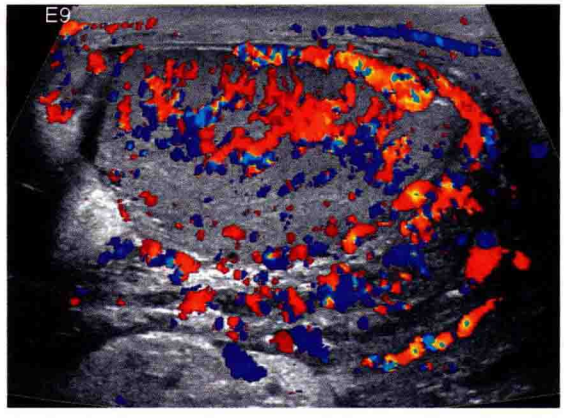
COLOR PLATE 44 **A,** Dual bilateral image of right testicular torsion. The affected testis is enlarged, is hypoechoic, and lacks blood flow, and there is a small hydrocele. **B,** This hyperechoic mass within a complex hydrocele is a torqued appendix testis. Note the hyperemic tissue surrounding the abnormality. The testicle was normal. (See Fig. 28-22.)



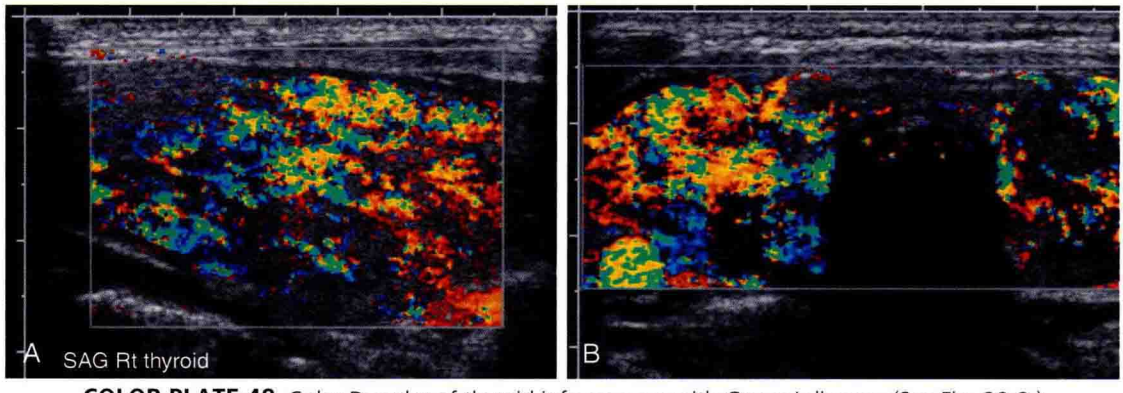
COLOR PLATE 45 Testicular hematoma resulting from a motorcycle straddle injury does not have blood flow within it. (See Fig. 28-23.)



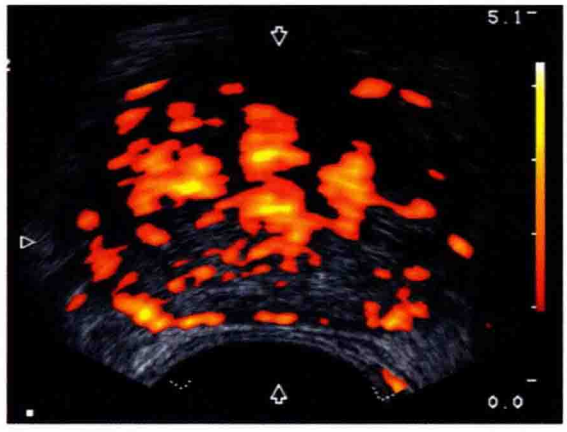
COLOR PLATE 46 **A,** Longitudinal image of an enlarged and hypoechoic testis was acquired early in the examination. Spectral Doppler at that time showed diminished, high-resistance blood flow. **B,** Image of the same testis at the end of the examination shows normal perfusion. Spectral Doppler measurements at this time showed normal resistive index. (See Fig. 28-27.)



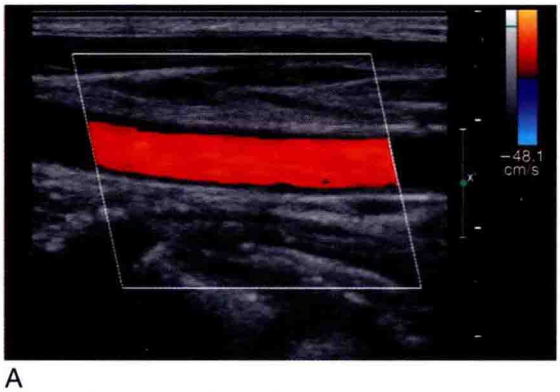
COLOR PLATE 47 Longitudinal color Doppler image of the testicle and epididymis. (See Fig. 28-28, *B*.)



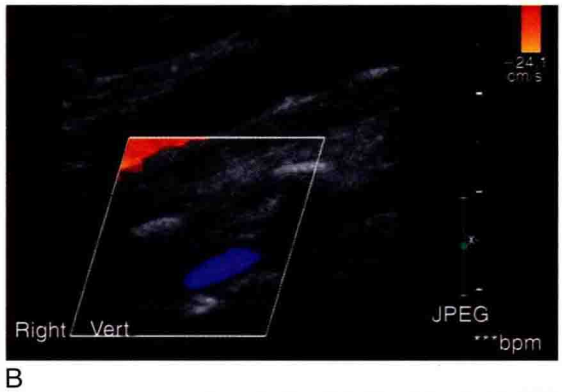
COLOR PLATE 48 Color Doppler of thyroid inferno seen with Graves' disease. (See Fig. 29-2.)



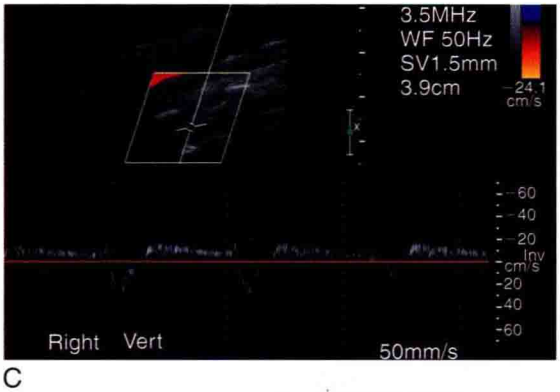
COLOR PLATE 49 Prostatitis. Hyperemia evident with power Doppler imaging. (See Fig. 30-8.)



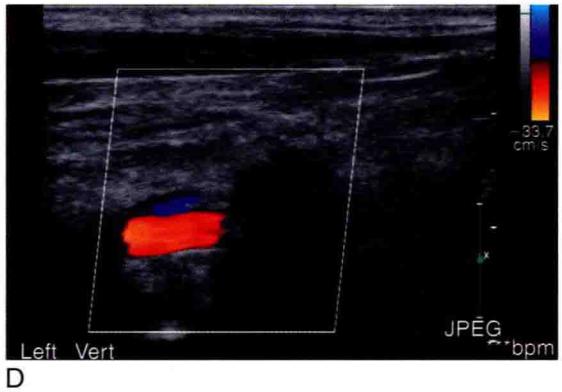
A



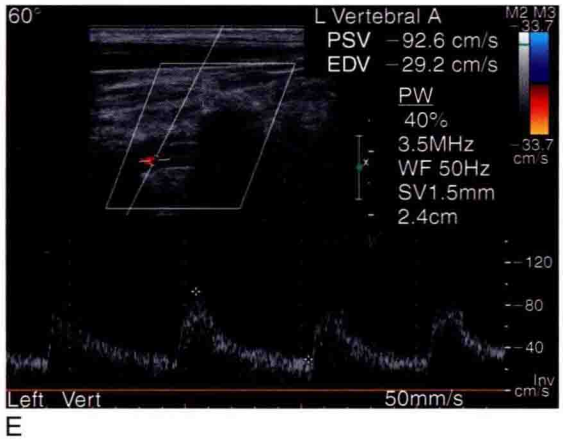
B



C

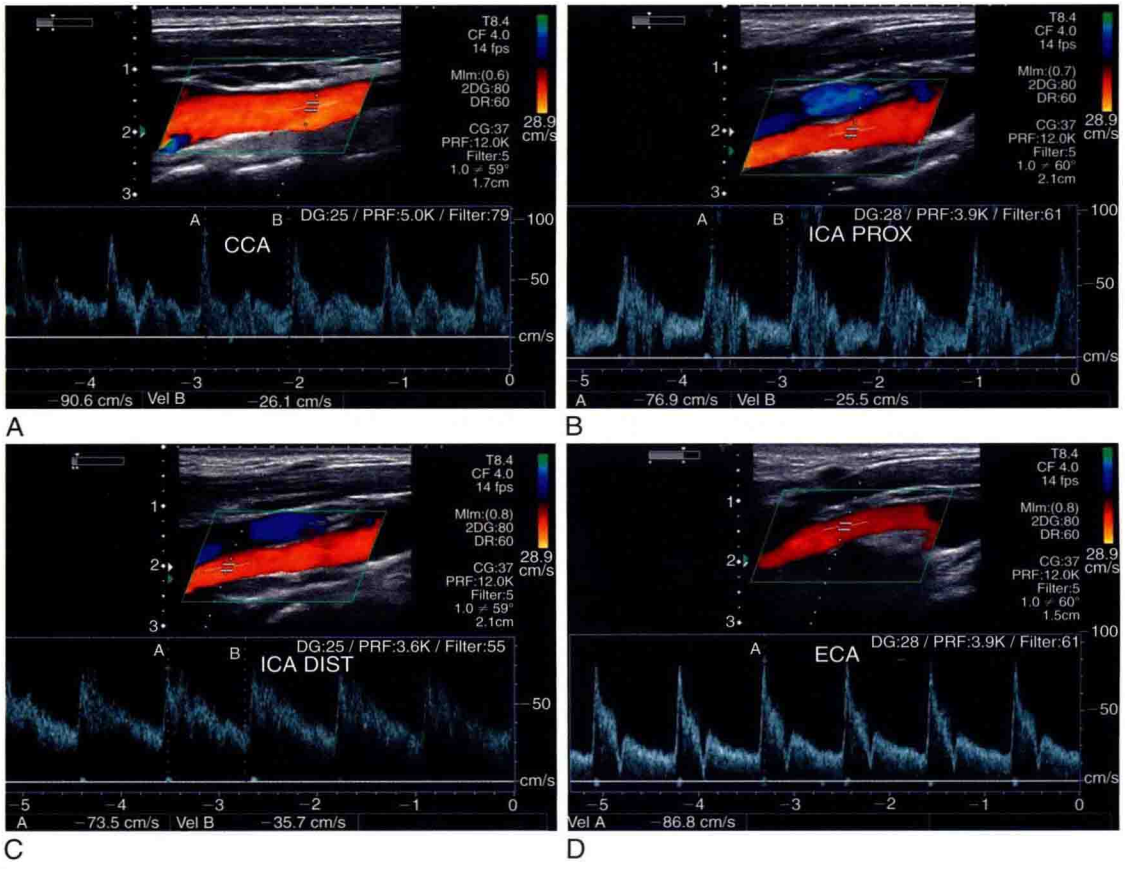


D

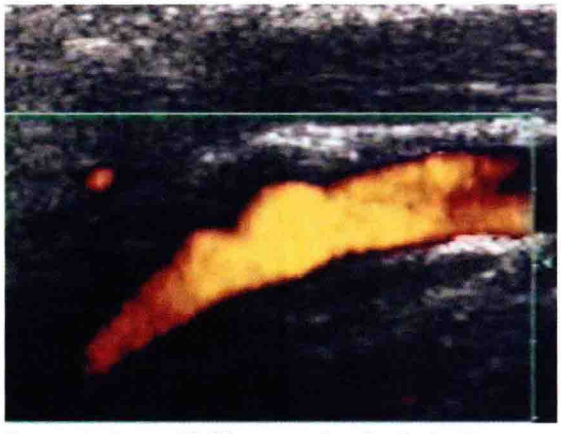


E

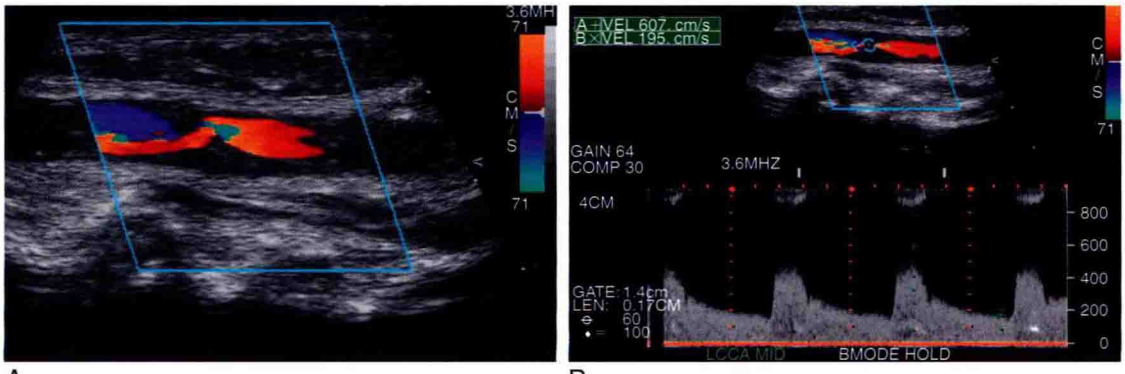
COLOR PLATE 50 **A,** Right common carotid artery with color flow Doppler. **B,** Retrograde color flow in right vertebral artery. **C,** Retrograde spectral Doppler in right vertebral artery. **D,** Antegrade flow in left vertebral artery. **E,** Antegrade flow in left vertebral artery. (See Fig. 34-1, *A-E.*)



COLOR PLATE 51 Spectral Doppler waveforms taken in CCA **(A)**, proximal ICA **(B)**, distal ICA **(C)**, and ECA **(D)**. PSV and EDV measurements are seen in the common carotid artery and proximal and distal ICA. (See Fig. 34-17, *A-D.*) *(Courtesy Deziree Rada-Brooks, BSHS, RDMS, RVT.)*

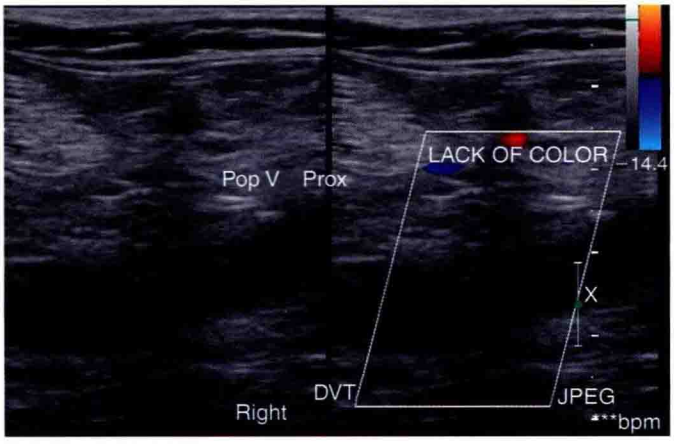


COLOR PLATE 52 Internal carotid artery from a patient with fibromuscular dysplasia. Note peapod appearance of artery. (See Fig. 34-21.) *(Courtesy Doug Marcum, Orlando Ultrasound Associates, Inc., Orlando, Florida.)*

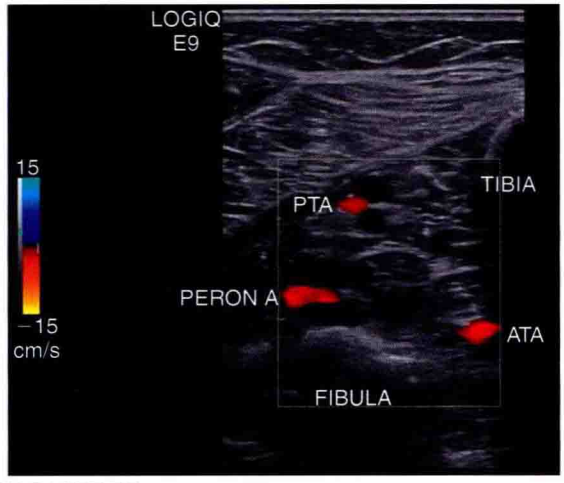


A B

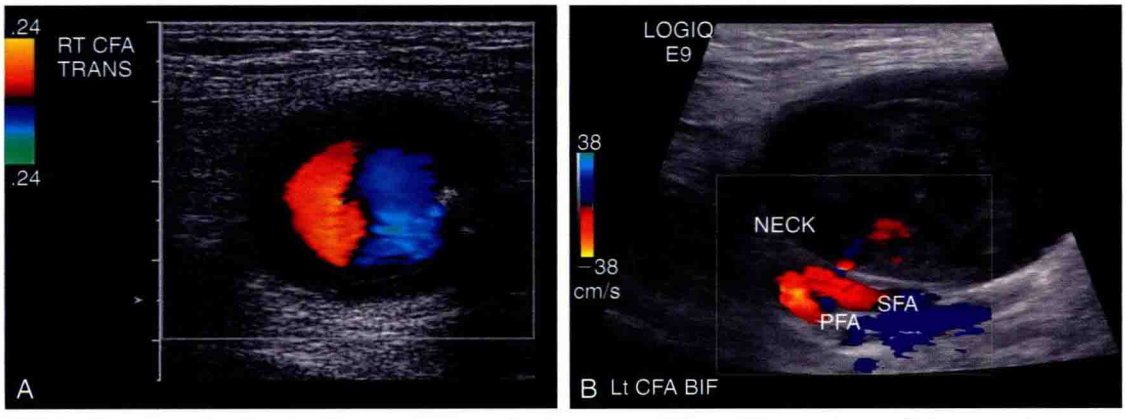
COLOR PLATE 53 Images of left CCA with color with color Doppler **(A)** and spectral analysis **(B)** demonstrating a peak systolic velocity of 607 *cm/s and peak diastolic velocity of* 195 *cm/s.* (See Fig. 34-22.)



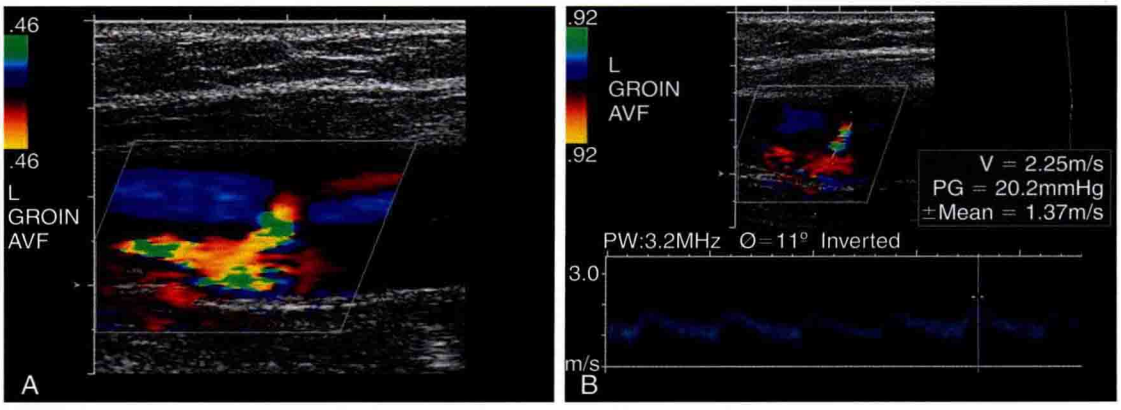
COLOR PLATE 54 Longitudinal image right popliteal vein with lack of color Doppler flow. (See Fig. 35-2.) *(Courtesy Maureen O'Neil DiGiorgio, RDCS, RVT.)*



COLOR PLATE 55 Sonographic, cross-sectional (transverse) image of the calf vessels. Note the relationship of the vessels to the tibia and fibula. (See Fig. 36-1, *C.*)



COLOR PLATE 56 **A,** Yin-yang color Doppler flow pattern seen in aneurysms of the native vessels or within a pseudoaneurysm. **B,** Pseudoaneurysm with evidence of internal thrombus formation and a visible neck connecting to the superficial femoral artery *(SFA).* (See Fig. 36-3.)



COLOR PLATE 57 **A,** AVF with clear communication between the artery and vein. Also supporting the diagnosis is the presence of a tissue bruit as is evident by the ghosting, or flash artifact in color Doppler. (See Fig. 36-4.)

COLOR PLATE 58 Distal anastomosis of a vein graft to the smaller caliber native vessel *(arrows)*. Note the normal finding of backflow into the native vessel *(arrowhead)*. (See Fig. 36-5, *B*.)