ABSTRACTS OF CURRENT LITERATURE

Indium-III Platelet Scintigraphy in Cerebrovascular Disease. W. J. Powers, B. A. Siegel, H. H. Davis, C. J. Mathias, H. B. Clark, M. I. Welch; Washington Univ. Schl. Med., Malinkrodt Inst., St. Louis, MO. *Neurology* 32:938–943, 1982

The correlation between abnormal results from indium-111 labeled autologous platelet scintigraphy of the neck and abnormal carotid arteriograms was examined in 100 patients. The results of these studies were compared with the clinical incidence of stroke or ischemic cerebral disease and the effects of pharmacologic treatment.

Each patient received an injection of 100 to 550 mCi of labeled autologous platelets i.v. and were imaged with gamma camera within 4 hr after the injection and on the subsequent day. Carotid arteriograms were performed by tracheal or femoral arterial puncture. In four cases, specimens obtained at carotid endarterectomy were examined for radioactive foci corresponding to those seen scintigraphically.

The results of indium-111 platelet scintigraphy and carotid arteriography were compared site-by-site for four regions with highly significant correlation ($X^2_c = 23.9$, $p = 10^{-6}$). Carotid endarterectomy specimens confirmed the presence of radioactive platelet aggregates in the cases studied. No correlation was found between abnormal scintigraphic findings and the presence of clinically symptomatic disease or the risk of stroke. In 77 patients treated with either antiplatelet drugs or anticoagulants, the frequency of positive images was not affected by these drugs either singly or in combination. These findings suggest that formation of platelet thrombi in the cervical carotid artery is not necessary or sufficient to cause ischemia or infarction in the corresponding cerebral hemisphere and that other factors determine whether cervical carotid lesions will cause symptomatic neurologic disease.

Glue-Sniffing as a Cause of a Positive Radioisotope Brain Scan. C. M. Lamont, F. G. Adams; Department of Diagnostic Radiology, Glasgow, Scotland. *Eur J Nucl Med* 7:387–388, 1982

Convolutions, cerebellar degeneration, permanent brain damage, hypokalemic periodic paralysis, and peripheral neuropathy are known complications of the intoxicant effects of solvent abuse. The authors report a 15-yr-old schoolboy who was admitted to hospital following four grand mal seizures. On examination the patient was found to be stuporous but responsive to speech. No focal neurological signs were present. Investigations, which included a CAT brain scan, skull and chest radiographs, EEG, metabolic and viral screening, were normal. Two brain biopsies were performed and except for some edema, the tissue proved to be normal. Following information that the patient had been involved in glue-sniffing, the brain tissue samples were further analysed and high levels of toluene were found. Blood samples also contained high concentrations of toluene. Nine months after the anoxic episode due to glue inhalation, the patient exhibited mild left-sided weakness, bizarre behavior, and epileptiform seizures. An EEG revealed a diffuse disorder of both hemispheres, and the radionuclide brain scan showed a large wedge-shaped area of increased uptake in the right frontoparietal region consistent with an infarction. Several small lesions were also seen scattered throughout the cerebral hemispheres. These accumulations of nuclide corresponded to the encephalopathy following the epileptiform seizures after glue-sniffing.

Iodine-124-Labeled Triiodothyronine in Rat Brain: Evidence for Localization in Discrete Neural Systems. M. B. Dratman, Y. Futaesaku, F. L. Crutchfield, M. N. Berman, B. Payne, M. Sar, and W. E. Stumpf; Tokyo Medical and Dental University, VA and Med. College of Pennsylvania, and University of North Carolina. *Science* 215:309–312, 1982

The marked changes observed in the nervous system of patients with thyroid imbalance have been attributed to hormone-mediated events outside the nervous system. This research presents evidence that the thyroid hormones act directly in the mature brain. Adult male rats, surgically thyroidectomized, received 1 mCi each of I-125 T_3 (specific activity 3000 $\mu Ci/\mu g$). Three hours later they were decapitated and the brains sectioned and applied to film for 7 mo, using thaw-mount methods.Differences in concentration between areas of the brain were readily visible. A second experiment was performed to determine whether the concentration was saturable with cold T_3. Conventional preparation of sections gave different autoradiographic results, suggesting loss of some of the activity in the preparation.

Radionuclide Assessment of Sequential Changes in Left and Right Ventricular Function Following First Acute Transmural Myocardial Infarction. M. Nemerovski, P. K. Shah, M. Pichler, D. S. Berman, F. Shellock, H. J. C. Swan. Cedars Sinai Med. Ctr., Los Angeles, CA. *Am Heart J* 104:709–717, 1982

The authors used radionuclide ventriculograms to evaluate the sequential changes in left (LV) and right (RV) ventricular ejection fraction(EF) and regional LV wall motion following first transmural acute myocardial infarction (AMI), and to relate such alterations to short-term prognosis. Fifty-four patients with anterior (28) and inferior (28) AMI underwent three sequential studies; within 48 hr of onset of chest pain (study I), between days 3 and 6 (study II), and between 7 and 25 days (study III). Twenty-six of 28 patients with anterior MI had an initial LVEF of 0.54 compared with 13 of 26 patients with inferior MI. Eleven of 26 with inferior MI had an initial RVEF of 0.39% compared with eight of 27 with anterior MI. There were no overall significant serial changes in mean LVEF or mean RVEF in patients with either anterior or inferior MI. From study II to study II LVEF did not change in 44%, improved in 24%, worsened in 31%. From study I to study III, LVEF remained unchanged in 35%, improved in 39%, and worsened 11%. From study I to study II, RVEF remained unchanged in 38%, improved in 48%, and worsened in 14%. Changes in EF tends to occur early in the hospital course, with little subsequent changes. Early determination of LVEF has prognostic implications, whereas the subsequent changes are less closely related to short-term prognosis.

Postoperative Evaluation of the Fontan Procedure by Radionuclide Angiography. G. G. Janos, M. J. Gelfand, D. C. Schwart, S. Kaplan; Children's Hosp. Med. Ctr., Cincinnati, OH. *Am Heart J* 104:785–793, 1982

Seven patients with complex cyanotic congenital defects were evaluated by radionuclide angiography (first-pass and gated-blood pool imagings) after Fortan-like procedures. Residual right-to-left

shunts, right atrial outflow and pulmonary arterial obstruction, and left ventricular dysfunction were demonstrated by these techniques. Because of right atrial (RA) enlargement, RA ejection fraction was easily measured by gated study in all patients. Five of seven patients had early postoperative problems: one died; two required reoperation; one awaits repeat catheterization in preparation for surgery; and one requires medical decongestive therapy. The radionuclide method was used successfully to identify the postoperative complication in each of these five patients. Correlation with cardiac catheterization and contrast angiography was excellent. The authors recommended that radionuclide angiography is useful in the preoperative and postoperative evaluation of patients having Fortan-like procedures.

Use of Radionuclide Ventriculography for Assessment of Changes in Myocardial Performance Induced by Disopyramide Phosphate. P. R. Kowey, P. L. Friedman, P. J. Podrid, J. Zielonka, B. Lown, J. Wynne, B. L. Holman; Harvard Univ. School, Boston, MA. *Am Heart J* 104:769–774, 1982

To assess the response of disopyramide (DP) to left ventricular (LV) performance in the patients with pre-existing LV abnormalities, 11 normal subjects (Group I) and 12 patients with impaired ventricular function (Group II) underwent radionuclide gated-blood pool study (gated study) before and after 300 mg administration of DP by mouth. In only one of Group I was LV ejection fraction (LVEF) reduced. In Group II patients LVEF decreased from 35% to 26%, and depression of function was most pronounced in regions with poorest baseline one. Six of group II patients had cardiomyopathy, and six had myocardial infarction. The authors concluded: (1) Patients with LV dysfunction are particularly susceptible to the depressant effects of DP; (2) Gated study is a sensitive technique for detecting DP induced changes in ventricular performances; (3) Gated study before and shortly after a dose of DP orally may help to identify those patients at risk.

Radionuclide Angiography of the Popliteal Arteries in Occlusive Vascular Disease. M. L. Wastie, J. G. Hardy, R. J. Lemberger; University Hospital, Nottingham, Great Britain. *Eur J Nucl Med* 7: 451–454, 1982

One of the most common cause of chronic ischemia in the leg is occlusion of the superficial femoral artery, and a femoropopliteal bypass graft may be beneficial. The popliteal artery however, must be patent for insertion of the distal part of the graft. The authors compared the preoperative intravenous radionuclide angiograms with the operative popliteal X-ray angiograms in 46 patients. For radionuclide angiography 12 mCi (450 MBq) of pertechnetate were injected in the basilic vein, and sequential images recorded on X-ray film at 2-sec intervals, with data simultaneously acquired in a computer (64*64 matrix, 0.8 sec intervals). A summated image was displayed and time-activity curves were generated and analysed to provide arrival time, input rate, and peak activity data. The lower aorta, iliac, and the proximal superficial femoral arteries were visualized following a bolus injection of 12 mCi of In-113m chloride. The operative popliteal X-ray angiogram was performed as usual and demonstrated the popliteal and the lower leg arteries. Both imaging modalities were compared using a four-point grading system, which corresponded to the amount of artery stenosis. A correlation coefficient of 0.65 was found when radionuclide grading was compared with intraoperative radiographic grading. The patency had been assessed with regard to the presence of a palpable femoral pulse. All the predictions of occluded popliteal arteries (n = 5) were correct in radionuclide angiography when the femoral pulse was palpable. Two occluded arteries in the intraoperative popliteal angiogram were incorrectly classified as patent (two were false positive, sensitivity (32/34)*100 = 94%). When the femoral pulse was not palpable the radionuclide angiography became unreliable for prediction of an occluded popliteal artery. The results of the study showed quantitative data to be unreliable for the prediction of the patency of the popliteal arteries.

First-Pass Radionuclide Angiocardiography in the Determination of Left-to-Right Cardiac Shunt Site in Children. Jia He Tian, I. Provan, C. Murray, B. Walker, R. Hoschl, D. Choy, A. Freeman; Prince Wales Hosp., Randwick NSW 2031, Australia. *Catheter Cardiovasc Diag* 8:459–478, 1982

Using first-pass radionuclide angiography, 102 children were studied to ascertain the level of left-to-right shunt. By cardiac catheterization atrial septum defect (ASD) was established in 26, ventricular septum defect (VSD) in 45, patent ductus arteriosus (PDA) in 12, and no shunt in 19. Time-activity curves were generated over the right atrium and ventricle. T_1 was that time at 10% of the upslope to the peak; T_2, the time between the peak and 50% count rate on the downslope; the time ratio T_2:T_1 was calculated (TR); C_1, the peak count rate; C_2, the count rate at twice T_1; C_3, the count rate at $3 \times T_1$, C_4 the count rate at $4 \times T_1$. All the ASD group had TR values greater than 3.0 and C_4:C_1 values greater than 0.5. The authors concluded the ASD can be identified by the count ratio C_4:C_1 and time ratio T_2:T_1 but cannot be relied on to diagnose VSD or PDA.

Growth Rate of Head and Neck Tumors. E. Galante, G. Gallus, F. Chiesa, A. Bono, I. Bettoni, R. Molinari; Università Milano, Italy. *Eur J Cancer Clin Oncol* 18:707–712, 1982

The authors evaluated the biologic characteristics of head and neck tumors. These tumors represent a well-known group of lesions, the differentiation of which is based on the site of the primary cancer rather than on the histologic type, mainly squamous cell carcinoma. Death results usually from local progression of the cancer rather than from distant metastases, and prognosis depends on the size of the primary tumor and on the degree of lymph node involvement. Seventeen cases of local recurrences were analysed, all of whom were previously treated surgically. The actual doubling time (DT) was calculated using: $DT = \ln 2/b$ with $b = (\ln V(1) - \ln V(0))/(T(1) - T(0))$. V(0) is the initial tumor volume at time T(0); V(1) is the tumor volume of the recurrence tumor at time T(1). Seven tumors localized on the lips had a median doubling time of 11.4 days, compared with 6.8 days for tumors of the tongue (4 cases, difference not significant with $p > 0.1$). Statistically significant differences were found when the tumors were classified according to sex (male: median 10.4 days, female: 7.1 days). The doubling times of the seventeen local recurrences were compared with the values of 31 pulmonary metastases reported in the literature. The median of all local recurrences (17 cases) was 9.7 days; the pulmonary metastases (31 cases) had a median doubling time of 45.0 days. In seven patients who died the distribution of the DT values was correlated with the survival time.

^{67}Ga Scanning for Assessment of Disease Activity and Therapy Decisions in Pulmonary Sarcoidosis in Comparison to Chest Radiography, Serum ACE and Blood T-Lymphocytes. H. Köhn, H. Klech, A. Mostbeck, F. Kummer; Wilhelminenspital, Vienna, Austria. *Eur J Nucl Med* 7:413–416, 1982

Sarcoidosis is defined as a granulomatous, multisystemic disorder of unknown etiology, characterized by an increased cellular immune reaction at the site of disease. In most patients the granulomas resolve spontaneously, but about 20% of the patients had evidence of interstitial fibrosis. Steroid treatment is effective, but the assessment of the disease activity is difficult. The role of Ga-67 in the assessment of disease staging and activity in terms of sensitivity and specificity was compared with chest radiography,

serum angiotensin-converting enzyme (ACE) and blood T-lymphocytes with regard to therapeutic decisions. Clinical symptoms, typical radiographic signs, and deterioration of pulmonary function were the staging parameters. One group consisted of 35 patients with active sarcoidosis, and the other group comprised 25 patients with inactive disease. All chest radiograms were performed PA and lateral and assessed independently by two observers. Seventy-two hours after injection of 3 mCi Ga-67 citrate, scans were made in two projections. These images were also assessed independently by two observers, and the accumulation of nuclide was scored according to the relation lung activity:liver activity. ACE levels were photometrically measured, with the upper limit concentration at 24 U/ml. Blood T-lymphocytes were classified as pathological if a reduction below 40% of total lymphocytes was observed. In patients with active disease the sensitivity of Ga-67 scans was 94%; for chest radiograms, 80%; for ACE, 70%; and for blood T-lymphocytes, 48%. Since negative chest radiograms were used for the classification of inactive sarcoidosis, radiography was not evaluated for specificity. When the disease was inactive, true-negative results were obtained in 68% of the Ga-67 scans; ACE was true negative in 88%; and blood T-lymphocytes in 73%. When the patients with active disease were subdivided into two groups, radiographical type I (bilateral hilar adenopathy) and type II–III (pulmonary involvement with or without adenopathy) or extrapulmonary sarcoidosis, Ga-67 scans had the highest sensitivity, 91%. Twenty patients, six with and 14 without steroid therapy had follow-up examinations. In these patients Ga-67 uptake and ACE levels were reduced when clinical remission was present, whereas chest radiographs remained unchanged in 25%. The authors conclude that a negative Ga-67 scan together with a normal ACE level gives a high predictive value for sarcoidosis staging. Moreover Ga-67 proved a reliable, noninvasive method for therapy monitoring.

Tomographic Gallium-67 Citrate Scanning: Useful New Surveillance for Metastatic Melanoma. J. M. Kirkwood, J. E. Myers, D. R. Vlock, R. Neumann, S. Ariyan, A. Gottschalk P. Hoffer; Yale Univ. Schl. Med., New Haven, CT. *Ann Intern Med* 97:694–699, 1982

From 1978 through 1980 using an Anger tomographic 12-plane scanner, these authors evaluated 114 scans (570 sites) in 67 patients having metastatic melanoma. Diagnoses were confirmed by clinical evaluation, roentgenography, nongallium radionuclide study, or histologic examination. After bowel catharsis, patients were imaged 48 hr following a 10 mCi i.v. dose of gallium-67 citrate (and at 72 hr when necessary). Assessment of lymph nodes or soft tissue on Ga-67 scans revealed 36 true-positive (TP) lesions and 74 true-negative (TN) studies with one false positive (FP) and four false negatives (FN) for a diagnostic sensitivity of 90% with a specificity of 99%. In the chest (lung including mediastinum), 15 TP lesions and 92 TN findings with no FP but seven FN detected, indicated 68% sensitivity and 100% specificity. In abdominal viscera including the liver there were nine TP lesions and 105 TN findings with no erroneous results, yielding both sensitivity and specificity of 100%. For bone, there were eight TP lesions and 105 TN with one FP and no FN giving a sensitivity of 100% and a specificity of 99%. In brain, however, Ga-67 scintigraphy failed to detect four lesions but showed 110 TN studies for a sensitivity of 0% but specificity of 100%. Overall in these patients, sensitivity was 81.9% and specificity was 99.6%. Discordant results that occurred when the Ga-67 scan was positive and the site was clinically occult proved to be true positive in six of seven lymph nodes or soft tissue sites, in three of three lung or mediastinal sites, in six of six abdominal sites, in one of two skeletal sites, but none in brain studies. In summary, success in detecting lymph node disease suggests that tomographic Ga-67 imaging is useful for staging patients, especially those with truncal melanomas where lymphangiography is impractical. Also, success in detecting intra-abdominal and bone disease may negate the need for multiple radionuclidic or roentgenographic imaging techniques.

Isosorbide Dinitrate and Nifedipine Treatment of Achalasia; A Clinical, Manometric, and Radionuclide Evaluation. M. Gelfond, P. Rozen, T. Gilat; Municipal Govt. Medical Center, Tel Aviv, Israel. *Gastroenterology* 83:963–969, 1982

Nifedipine (NIF) was compared with isosorbide dinitrate (ID) by manometry, radionuclide studies, and clinical response for effectiveness in achalasia. The study group consisted of 15 patients (six men and nine women, ages 16–73 yr) with established, symptomatic achalasia. Standard pull-through manometric techniques were used for measurements of lower esophageal sphincter (LES) pressures. The radionuclide studies used a semisolid meal of corn flakes, sugar, and milk labeled with Tc-99m consumed in a sitting position with the back against a gamma camera interfaced to computer for data acquisition and processing to yield a continuous image of esophageal emptying on the display screen. After baseline studies, each patient received either 5mg of ID or 20mg of NIF sublingually, followed by manometric or radionuclide studies, with the second drug studied in a similar fashion 1 wk later. Both medications caused a significant fall in the LES pressure ($p < 0.01$) during the 30 min of recording, but neither caused significant changes in the body of the esophagus. At 2 min esophageal retention of the radiolabeled test meal was significantly less ($p < 0.01$) in the ID study compared with baseline (45.8% ± 37.7 vs. 70.9% ± 24.1). The same value after NIF was 61.3% ± 33.7, not significantly different from baseline. Only ID significantly affected the 10 min retention of the radiolabeled test meal. Symptomatic relief was present in 13 of 15 patients on ID therapy but in only 8 of 15 patients taking NIF.

The Value of Bone Imaging in Multiple Myeloma. J. W. Frank, S. LeBesque, R. B. Buchanan; Royal South Hants Hospital, Southampton, Great Britain. *Eur J Nucl Med* 7:502–505, 1982

Radionuclide imaging of bone is most commonly used to rule out metastatic disease. Myeloma consist of neoplastic plasma cells that destroy bone, causing the typical lytic lesions seen on radiographs. Twenty patients with multiple myeloma were studied (14 men, 6 women; age range 40–77 yr) Twelve patients had IgG paraprotein peaks, five had IgA peaks, and three, Bence Jones proteins only. The full radiographic skeletal survey comprised lateral skull, lateral cervical, dorsal and lumbar spine, AP lumbar spine, pelvis, humeri and femora, and a PA chest radiograph. For radionuclide examination, 740 MBq Tc-99m methylenediphosphonate (Tc-MDP) were injected. Images of the corresponding regions were made two hours later. Scintigraphic images and radiographs were reported by one observer and compared with the clinical and hematological data. Abnormalities due to myeloma were radiographically observed in 17 patients and in the scintigrams in 18 patients. In both imaging modalities, all degenerative alterations were excluded. Eleven radionuclide images demonstrated focal areas of increased uptake (lesions), five were negative, and two showed both photon deficient areas and areas of increased uptake. The areas of radionuclide uptake were almost all due to pathological fractures, and a large number were seen in the dorsal and lumbar spine. All of the photon-deficient lesions were large lytic lesions. The multiple, small, punched-out lesions typical of myeloma were not apparent as photon deficient. Thus the number of areas involved was underestimated by 50%.

Transmission of Gamma Camera Signals Over Long Coaxial Cables. C. Craig Harris, Department of Radiology, Duke University Medical Center, Durham, NC. *Radiology* 142:525–527, 1982

The author has successfully transmitted simulated gamma

camera analog position and digital strobe signals over a 732 meter RG 62A/U coaxial cable. An amplifier was developed similar to a high performance line driver currently used for shorter cables with special sending-end termination and compensation methods. The circuit specifications incorporated into the design assured minimal overshoot, maximum flatness of the pulse, and minimal baseline displacement after pulse termination. With proper sending-end compensation, there should be no limit to cable length beyond attenuation losses. Theoretically, however, a problem might develop when two sets of signals are present in the cable simultaneously leading to image resolution loss. This could not be investigated until actual signals are transmitted.

In-Vivo Carbon-13 Nuclear Magnetic Resonance Studies in Mammals. J. R. Alger, L. O. Sillerud, K. L. Behar, R. J. Gillies, R. G. Schulman, R. E. Gordon, D. Shaw, P. E. Hanley; Yale University and Oxford Research Systems. *Science* 214:660–662, 1981

The article describes two experiments. In the first, the forelimbs of rats and human arms were studied with NMR of natural C-13. Several C-13 resonances are resolved, belonging to fatty material, a spectrum that could be used to characterize nutritional status and fat metabolism. The second experiment involved using C-13 labeled compounds as "contrast agents" to study metabolic pools. C-13 glucose was introduced into the stomach of a fasted rat. The C-13 spectra of the liver were observed for 195 minutes at intervals. The glucose signals decayed while a signal assigned to glucogen increased. In vitro experiments with C-13 glucose in mixtures with tissue suggest that 3mM of metabolite may be detected in 4 ml of tissue in 12 min. The use of such contrast media for NMR will considerably widen the kinds of research open to this technique.

Interspecies Variations in Mammalian Lens Metabolites as Detected by Phosphorus-31 Nuclear Magnetic Resonance. S. J. Kopp, T. Glonik, J. V. Greiner; Chicago College of Osteopathic Medicine and University of Illinois Eye and Ear Infirmary. *Science* 215: 1622–1624, 1982

After excision from the donors, lenses of humans and seven other mammalian species were analyzed with P-31 NMR, either intact in Earle's buffer or as perchloric acid extracts. Cat and dog lenses most closely resemble human lenses with fewest significant metabolite differences, whereas rabbit and cow lenses are the least similar. The use of NMR to study tissue differences will be the basis of NMR studies of normal and diseased tissue in the future.

Ultrasound-Directed Transvaginal Aspiration Biopsy of Pelvic Masses. D Graham, RC Sanders; The John Hopkins Medical Institutions, Baltimore, MD. *J Ultrasound Med* 1:279–280, 1982

The authors present three cases in which masses adjacent to the vaginal canal were successfully aspirated by a transvaginal route using ultrasound guidance. An Iowa trumpet device was used to guide the needle and real-time ultrasound was used to determine when the collection had been entered. Both diagnostic and therapeutic implications for the technique are possible, and in the three cases presented surgery was averted by the use of the technique. The authors do not advocate the needle biopsy of a solid ovarian lesion as a primary diagnostic procedure but suggest that the diagnosis of pelvic infection, recurrent malignant disease, or hematoma formation can be made by this means. Illustrative examples are provided.

B-Mode Sonography of Blood Clots. JCU Coelho, B Sigel, JC Ryva, J Machi, SA Renigers; University of Illinois at the Medical Center, Chicago, IL. *J Clin Ultrasound* 10:323–327, 1982

In an in vitro experiment on clotted blood, the authors varied hematocrit, transducer frequency, and time following clotting. The results indicate that fresh clot when examined with a high frequency (5, 7.5, and 10 MHz) transducer was highly echogenic but seen as sonolucent with 3.5 and 2.25 MHz transducers. Echogenicity of the clot decreased with a sequential decrease in the hematocrit, and echogenicity diminished over a period of 96 hours of sequential observation immediately following clotting. The authors conclude that echogenicity of blood clot is produced by two mechanisms. Aggregation of red cells in a fibroin mesh produces the diffuse echogenicity seen immediately following clotting when the clot is examined by high frequency transducers, and the second form of echogenicity results from differences in acoustic competencies at boundaries and hence demonstrates transition from clot to serum. The former can be detected only with high-frequency transducers and the latter can be observed with any standard device. The in vitro study is offered as an explanation for previously published clinical descriptions of sonographic appearance of clotted blood.

Ultrasound Volume Measurements Comparing a Prolate Ellipsoid Method with a Parallel Planimetric Area Method Against a Known Volume. RT Geirsson, AD Christie, N Patel; Ninewells Hospital and Medical School, Dundee, Scotland. *J Clin Ultrasound* 10:329–332, 1982

Using phantom models of water-filled balloons scanned in a temperature-equilibrated water bath, the authors compared a planimetric method using sequential adjacent scans with the approximation provided by volume estimations of the prolate ellipsoid based on the three largest diameters. The mean error for the parallel planimetric method was 0.43% and for the prolate ellipsoid method 3.27%. The planimetric measurements fell within 5% of the actual volume in 93.3% of cases as opposed to only 33.4% with a prolate ellipsoid method. Both methods tended toward underestimation of the smallest volumes examined.

Real-time Ultrasonographic Evaluation of Normal Fetal Adrenal Glands. E Lewis, AB Kurtz, PA Dubbins, RJ Wapner, BB Goldberg; Thomas Jefferson University, Philadelphia, Pennsylvania. *J Ultrasound Med* 1:265–270, 1982

The authors examined normal fetuses after 30 wk of gestational life, measuring the long axis of adrenal gland and kidney. The fetal adrenal glands could be imaged in 31 of 34 patients and bilaterally in 14 when the fetal back was directed toward the transducer. The long axis of the normal adrenal had a range of 14 to 22 millimeters as compared with the range of renal lengths of 27 to 42 millimeters. The ratio of long axes of adrenal to kidney were .48 to .66 mm. The determinations correlated well with material from newborn autopsies. Echogenicity of the fetal adrenal glands was relatively similar to that of the adjacent kidney, demonstrating a poorly echogenic periphery with a brightly echogenic center in more than half of the cases. The scanning technique is described and illustrated diagrammatically. The inference to be drawn is that failure to image either kidney or adrenal gland after 30 wk implies an abnormal state. Representative sonograms, normal measurements, and diagrams are provided.

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