

ABSTRACTS OF CURRENT LITERATURE

A Multiobserver Comparison of $^{99m}\text{TcO}_4^-$ and ^{123}I Thyroid Imaging. B. Shapiro, K. Britton, A. Fountos, M. Granowska, L. Hawkins, P. Kiriaki, S. Londres, C. Nimmon, S. Poston; London, England. *Eur J Nucl Med* 6:135-138, 1981

The authors compared results of thyroid imaging using pertechnetate and I-123. Their goal was to determine the predictive accuracy of the diagnosis obtained with each radionuclide and to identify those areas in which I-123 is clearly superior to $^{99m}\text{TcO}_4^-$. Forty consecutive patients were studied with a gamma camera equipped with a 3-mm pinhole collimator. One anterior view image was obtained. The skin-to-aperture distance was 7 cm. Imaging followed 20 min after injection of 2 mCi Tc-99m, and images contained 200,000 cts or were terminated after 20 min. Within one week a follow-up study was obtained after injection of 2 mCi of I-123, with scanning starting 20 min later. Images had equal counts to those obtained with pertechnetate. Seven patients were also imaged at 2 hr. Images were evaluated without clinical data by eight experienced observers for six morphological criteria. Diagnoses were given a confidence rating on a seven-step scale. A numerical index made it possible to compare results of the two examinations. Results of scintigraphy were compared with the final diagnosis based on clinical assessment, standard function tests, antibodies to thyroid components, histology, and ultrasound as needed. The authors found interobserver agreement and the observer confidence to be greater for scans obtained with I-123. Diagnoses based on $^{99m}\text{TcO}_4^-$ images agreed with the final diagnosis in 63% of the examinations, and in 75% of the examinations when images were obtained with I-123. In a clinical setting the pertechnetate images were concordant with the final diagnosis in 69%, the iodine image in 79% of the examinations. Iodine-123 scans obtained at 20 min and at 2 hr were similar. The pyramidal lobe was visible more frequently on the I-123 scans. The distribution of the confidence grading suggested that I-123 was of particular value in the assessment of solitary nodules of lesser activity and in multinodular goiter, and its use was also recommended when pertechnetate imaging failed to demonstrate an abnormality corresponding to a palpable nodule. Moreover, I-123 may be the radionuclide of choice for suspected ectopic thyroid. The authors conclude that radioiodine thyroid imaging continues to have a place in thyroid scanning.

Radioiodine Therapy of Carcinoma of the Thyroid. R. McConnell; Univ. of Texas Health Science Center, Houston, TX. *J Surg Oncol* 16:251-254, 1981

A combined surgical-radionuclide treatment of carcinoma of the thyroid: (a) should be used only in papillary, follicular, and mixed papillary-follicular lesions; (b) involves radionuclide staging after ablation of residual normal thyroid; and (c) involves radionuclide staging and treatment during follow-up until tumor is absent. The author presents a decision tree for successful diagnosis and treatment of a solitary thyroid nodule. Four weeks after surgical excision of the histologically positive lesion confined to the gland (surgical stage 1), the patient receives 100 mCi I-131 orally with total body imaging (including special neck and chest imaging) performed at 4, 7, and 10 days thereafter to ablate residual normal thyroid tissue and to detect functioning metastases. If the initial

radionuclide staging confirms stage 1, the patient is restaged 6 mo later by total body (including neck/chest imaging) 24-72 hr after receiving 5 mCi I-131. Metastases detected by radionuclide staging are treated with radioiodine. Since the author does not administer exogenous thyroid-stimulating hormone to improve metastatic uptake of radioiodide, he discontinues thyroxine replacement or propylthiouracil treatment before administration of I-131 intended for either imaging or treatment. Hematologic surveys are essential after radioiodide therapy to detect bone marrow depression, which may not ensue until 4-6 wk after therapy.

Radionuclide Salivary Imaging Usefulness in a Private Otolaryngology Practice. G. L. Schall, R. R. Smith, L. M. Barsocchini; St. Francis Memorial Hosp., San Francisco, CA. *Arch Otolaryng* 107:40-44, 1981

These authors report on 44 consecutive patients (ages 6-82 yr; 23 male, 21 female) referred within a community hospital for salivary gland imaging. After each patient received 10 mCi sodium pertechnetate (Tc-99m) i.v., the head and neck were imaged by gamma camera using a unique protocol of dynamic flow and static images appropriate for mass lesion or for functional disease. Thirty-eight of the patients were observed for up to 4 yr after the imaging study. Final anatomic diagnosis was made by autopsy, surgery, or clinical impression (the latter often based upon other radiologic or laboratory tests). Of those 38, the imaging was diagnostic in six patients: each of five persons with Warthin's tumor (a nonmalignant process), and one person with intraparenchymal abscess. The imaging was considered very useful in 14 other patients and somewhat useful in 11, for an overall total usefulness in 82% of the subjects. The imaging was felt to be very useful in evaluation of primary neoplasms, acute and chronic inflammatory conditions, sialadenitis, and sialolithiasis. It readily provides objective data for differential diagnosis of xerostomia. No patient received inappropriate therapy because of misleading data from the imaging study. The authors recommend greater implementation of salivary gland imaging in private otolaryngologic practice.

^{67}Ga Scintigraphy as an Index of Disease Activity in Pulmonary Sarcoidosis. Chr. Alberts, J. B. van der Schoot, A. S. Groen; Amsterdam, The Netherlands. *Eur J Nucl Med* 6:205-212, 1981

The authors studied 38 patients with Ga-67 scintigraphy for diagnosis and therapeutic evaluation of pulmonary sarcoidosis. The diagnosis was based on clinical, radiographic, and laboratory findings. Tissue biopsy was obtained from 36 patients. Chest radiograms, used to stage disease, were abnormal in all patients. Pulmonary function was evaluated. Chest scans in anterior and posterior position were obtained with a rectilinear scanner 48 hr after i.v. injection of 2 mCi of Ga-67. Ga-67 scans were rated negative when tissue uptake of the pulmonary parenchyma, hilum, and mediastinum failed to exceed the soft tissue activity registered over neck and shoulder. Scans were rated on a four-step scale. Ga-67 uptake was compared with the results of the chest radiograms. Disease activity was considered stable in 25 patients so that corticosteroid therapy was not required. Thirteen patients

were treated, and 12 had serial scintigrams to monitor therapy. Ga-67 scans were obtained at 2 and 6 wk after initiation of treatment and after therapy. Fifteen untreated patients had repeat scans at 6 mo. The authors report that 32 of 38 patients had an initially positive Ga-67 scan. Twenty of these patients had radiographic evidence of hilar lymphadenopathy. Fifteen of these had gallium uptake in the hilar region, whereas five had a negative Ga-67 scan. The study shows that pulmonary symptoms correlate poorly with extent of Ga accumulation. Ga-67 uptake decreased or disappeared in the 12 patients treated with high-dose prednisone within the 2-6 wk after initiation of treatment. Improvement appeared more gradual by radiography. The authors conclude that Ga-67 scans can be used as an index of disease activity in patient follow up whether corticosteroid therapy is initiated or not. The Ga scan can be useful to plan treatment, since conversion of a positive Ga-67 scan to a negative one indicates disease suppression.

Useful Hepatic Parenchymal Imaging in Hepatobiliary Scintigraphy. M. L. Brown, J. E. Freitas, H. W. Wahner; Mayo Clinic and Mayo Foundation, Rochester, MN. *Am J Roentgenol* 136:893-897, 1981

A comparison of hepatic parenchymal imaging using Tc-99m labeled iminodiacetic acid derivatives and technetium sulfur colloid was made in 50 patients. Hepatobiliary imaging was carried out by imaging for 500,000 or 1,000,000 counts following the intravenous administration of 5 mCi of either PIPIDA or HIDA, and liver-spleen scans were obtained at similar count levels following the intravenous administration of 5 mCi of technetium sulfur colloid. All studies were done within one week of each other. In 46 of the studies, the number of lesions as well as their position was similar. In 13 cases, the later (biliary phase) images allowed for more specificity. Of the four discordant images, a metastatic lesion was missed in a hepatobiliary scan, which was of poor technical quality. A liver-spleen scan revealed multiple filling defects but normal hepatobiliary scan in a patient with cirrhosis. A sulfur colloid scan showed a defect, found to be prominent biliary structures on the hepatobiliary image, and a cyst was missed on a sulfur colloid scan. Careful attention to the hepatic image on a hepatobiliary scan is important.

Simplified Radiolotope Technique for Assessing Gastroesophageal Reflux in Children. J. Z. Jona, J. R. Sty, M. Glicklich; Milwaukee Children's Hospital, Milwaukee, WI. *J Pediatr Surg* 16: 114-117, 1981

Gastroesophageal scintigraphy using 100-500 μ Ci of Tc-99m sulfur colloid was performed in 125 infants and children with symptoms and signs suggestive of gastroesophageal reflux and/or aspiration. The tracer material was instilled into the stomach of the fasting patient via nasogastric tube along with a usual feeding volume of 5% dextrose. Serial 1-min images were obtained during the first 30 min (supine) followed by 10 min imaging in the left lateral decubitus position if reflux had not been demonstrated. Delayed images of the chest were obtained after an 8-24 hr interval. Gastroesophageal reflux was demonstrated in 96 of the 125 patients and 18 had concomitant aspiration. Barium esophagrams were performed in 92 of the patients and only 38 demonstrated reflux by this method; however, one child did show reflux by barium study but not by esophageal scintigraphy. All patients with pulmonary aspiration demonstrated gastroesophageal reflux with scintigraphy during the early sequential images. Scintigraphy appears to improve sensitivity in the detection of reflux. Prolonged imaging may be carried out within acceptable radiation exposure levels, and pulmonary aspiration is readily detected.

Scintigraphic Localization of Pheochromocytoma. J. C. Sisson, M. S. Frager, T. W. Valk, M. D. Gross, D. P. Swanson, D. M. Wieland, M. C. Tobes, W. H. Beierwaltes, N. W. Thompson; University of Michigan, Ann Arbor, MI. *New Engl J Med* 305:12-17, 1981

An analog of guanethidine, meta-iodobenzylguanidine (MIBG), labeled with I-131, was administered intravenously to eight patients with pheochromocytomas, who were then scanned, at 24 and 48 hr later. The preparation of MIBG-I-131 was constituted such that there was a specific activity of at least 2.5 mCi/mg of drug and each patient received 0.5 mCi per 1.7 cm² of body surface area but never more than a total of 0.5 mCi. Patients were pretreated with Lugol's iodine to block thyroid uptake of I-131. In some patients scintigrams of the kidneys were made using appropriate Tc-99m radiotracers as an aid to more precise anatomic localization of areas of I-131 concentration. Scans were obtained in the posterior view from the urinary bladder to the base of the skull, and additional views were obtained where appropriate. Images were obtained by an Anger camera for 50,000 counts and 10% background subtraction was accomplished by a minicomputer.

In all eight patients with pheochromocytomas known to exist on the basis of urinary and plasma hormone levels (one patient suspected on the basis of an abnormal plasma norepinephrine level only), the site of a pheochromocytoma or pheochromocytomas was identified. In four of these patients, the CT scan failed to identify the tumor (one scan was technically unsatisfactory). The weights of the tumors ranged from 0.2 to 63 g. They were both intra-adrenal and extra-adrenal in location and benign as well as malignant.

Testicular Scanning: Clinical Experience With 72 Patients. K. H. Stage, R. Schoenvogel, S. Lewis; Univ. of Texas Health Science Center, Dallas, TX. *J Urol* 125:334-337, 1980

To evaluate the etiology of scrotal pain in 72 patients, testicular scanning immediately followed the initial clinical assessment. A peripheral venous injection of 10 mCi of Tc-99m pertechnetate was followed by a flow study consisting of 10 frames at 5-sec intervals and three static images made of 300,000 counts each. Fifteen patients were diagnosed as having testicular torsion, 14 of whom were subsequently found to have testicular torsion at surgical exploration. The one false-positive study occurred in a patient who had an incarcerated hernia that extruded into the scrotum. Forty-eight patients were diagnosed as having epididymo-orchitis or epididymides on the basis of the clinical and radionuclide examinations. One case of testicular rupture was also correctly diagnosed. The scan findings in these and other conditions causing scrotal pain are described.

Bayesian Analysis of Stress Thallium-201 Scintigraphy. R. G. Murray, J. H. McKillop, R. G. Bessent, I. Hutton, A. R. Lorimer, T. D. V. Lawrie; Glasgow, Scotland. *Eur J Nucl Med* 6:201-204, 1981

The usefulness of Tl-201 scintigraphy was evaluated with the goal of determining the influence of disease prevalence on diagnostic yield. One hundred patients with chest pain were examined, and the results were statistically evaluated with Bayesian analysis. A gamma camera interfaced with a minicomputer was used for Tl-201 stress scintigraphy, and multiple projections were obtained. Coronary heart disease (CHD) was diagnosed by selective coronary arteriography and left ventriculography. Vessel disease was considered significant when the luminal diameter was reduced by 50% or more. True positives, true negatives, false positives, and false negatives were determined. Disease probability with abnormal and normal scintigrams was calculated, and the ability of the test to discriminate disease was determined. Stress Tl-201 scintigraphy was positive in 59 patients, negative in 41. Arteriography demonstrated significant CHD in 60 patients. The statistical

analyses showed that the discriminant ability of the radioisotope study was greatest when disease prevalence was between 30% and 70%, falling off sharply above and below these limits. At a 50% prevalence, a positive scintigram increased probability of disease to 87%. At the same prevalence, a negative scan reduced probability of disease to 10%. With low-disease prevalence, false-positive scans are common. With increased probability of CHD, the diagnostic gain of a positive scan rose. With high prevalence of CHD, the gain from a positive result became small, increasing probability of CHD only slightly. A similar trend was calculated for negative test results. At a prior probability of 90% for CHD, a normal scintigram would still be associated with a probability for CHD of 54%. The authors conclude that Tl-201 scintigraphy has little value as a screening method, and it also offers little to patients with a high clinical probability of CHD. The study is recommended for patients with intermediate probability of CHD.

Short-Term and Long-Term Changes in Myocardial Perfusion After Percutaneous Transluminal Coronary Angioplasty Assessed by Thallium-201 Exercise Scintigraphy. H. O. Hirzel, K. Nuesch, A. R. Gruentzig, U. M. Luetolf; University Hospital, Zurich, Switzerland. *Circulation* 63:1001-1008, 1981

Thallium-201 myocardial scintigraphy was used to assess the regional myocardial perfusion change following percutaneous transluminal angiography (PTCA) for dilatation of coronary artery stenosis. Forty-nine patients (43 men and 6 women), ranging in age from 31 to 67 yr, had disabling, effort-dependent angina, no prior myocardial infarction, a single vascular lesion resulting in >70% luminal narrowing, and 5 had prior aortocoronary bypass surgery. PTCA was initially successful in 30 of 44 patients with stenosis of a coronary artery and in three of five patients with stenotic aortocoronary bypass graft. Of these 33 patients, 30 were restudied scintigraphically within 3 wk and 16 had additional follow-up study at 5-6 mo postdilatation. All scintigrams were obtained using 1.5 mCi Tl-201 chloride injected i.v. near the end of exercise stress-testing followed by immediate and delayed gamma camera views. Before PTCA Tl-201 activity in the region supplied by the stenotic vessel averaged $74 \pm 1\%$ of maximal activity after exercise and returned to normal at rest ($88 \pm 1\%$), ($p < 0.001$). Three weeks after PTCA these previously ischemic areas averaged $89 \pm 1\%$ of maximal activity after exercise ($p < 0.001$ compared with the corresponding values before PTCA) and $94 \pm 1\%$ at rest ($p < 0.01$ compared with the exercise values). Arteriographic assessment revealed increase of the luminal diameter of the stenotic vessel segment from an average of $15 \pm 2\%$ to $67 \pm 3\%$ ($p < 0.001$) of the pre- and poststenotic vessel diameter. Follow-up scintigrams at 5-6 mo intervals up to 30 mo after PTCA revealed normal perfusion in 13 of the 16 patients studied, although three had recurrence of stenosis demonstrated by decreased activity and confirmed angiographically. The findings of this study clearly demonstrate the usefulness of Tl-201 scintigraphy in documenting the results of PTCA.

Radionuclide Angiographic Assessment of Left Ventricular Function during Exercise in Patients with a Severely Reduced Ejection Fraction. W. L. Schoolmeester, A. G. Simpson, B. J. Sauerbrunn, R. D. Fletcher; Univ. of South Carolina School of Med., Columbia, SC. *Am J Cardiol* 47:804-810, 1981

Fifteen patients with ischemic cardiomyopathy (Group I) and 12 patients with primary cardiomyopathy (Group II), each of whom had a resting ejection fraction of 30% or less, underwent evaluation of their left ventricular function both at rest and following exercise utilizing radionuclide angiographic techniques. An in vivo technetium-labeled red-blood-cell pool was established, and data collected in frame mode with a total of 200,000 counts

(frame using an Anger camera). Computer-assisted analysis of the time-activity curves of the left ventricle was undertaken to determine the left ventricular ejection fractions.

Group I patients had a mean resting ejection fraction of $23.1 \pm 5.6\%$ and a mean exercise ejection fraction of $16.7 \pm 6.8\%$. Group II patients had a mean resting ejection fraction of $20.5 \pm 3.9\%$ and a mean exercise ejection fraction of $24.6 \pm 6.4\%$. One patient in Group I experienced an increase in ejection fraction with exercise and two patients in Group II underwent a deterioration in ejection fraction with exercise. Both of the latter were symptomatic at rest. The one patient in Group I who was able to increase the ejection fraction with exercise had an isolated stenosis of one coronary artery.

Induction of Pituitary Tumors by Combination of Oestrogenic Hormones and ^{90}Sr . A. Nilsson, P. Bierke, I. Haraldsson, A. Broome-Karlsson; Uppsala, Sweden. *Acta Radiol Oncol* 19:373-385, 1980

The observation that propensity to the development of cancer in mice exposed to Sr-90 is greatly increased by estrogen and decreased by corticosteroids stimulated this study. The authors sought to find a Sr-90 dose low enough not to induce osteosarcomas, but high enough to induce bone tumors when combined with estrogen and a dose that would induce tumors, but which in combination with corticosteroid would fail to do so. Unexpectedly, the authors found that low Sr-90 applications combined with estrogen induced pituitary tumors. Three groups of 75-day-old mice (250 in each group) were studied. One group received only Sr-90, another Sr-90 and estrogen, and the third group Sr-90 and corticosteroid. Each group was subdivided into three subgroups. Subgroup 1 contained 100 animals, and each was given $0.025 \mu\text{Ci Sr}$ per gram tissue; subgroup 2, 100 mice, each of which received $0.05 \mu\text{Ci}$ per gram, and subgroup 3, 50 animals, each of which received $0.200 \mu\text{Ci}$ of radioisotope per gram of tissue. A fourth group of 70 animals were given only estrogen. Animals were killed when moribund. The head was divided longitudinally, and bone tissue was decalcified. Sections were stained with hematoxylin-eosin and with tri-PAS. Pituitary tumors were classified according to their histologic features and affinity for stains. The authors found that 15-25% of the mice given Sr-90 and estrogenic hormone developed an early dilation of the pituitary sinusoids. A diffuse hyperplasia of the pituitary was seen before appearance of the first tumors. The time needed for tumor appearance was short. Of all mice given Sr-90 and estrogen, 48% developed tumors. 2% of those receiving only Sr-90 and 3% of the mice receiving Sr-90 and corticosteroid developed pituitary tumors. Mice that received only estrogen had a 10% tumor incidence. Of all tumors in the Sr-90-estrogen group, 10% were carcinomas. It is believed that the syncancerogenic effect observed is due to estrogen-induced proliferation of pituitary cells and increased sensitivity to radiation.

Radioactive Colloidal Gold in the Treatment of Endometrial Cancer: Mayo Clinic Experience 1952-1976. K. S. Fountain, G. D. Malkasian, Jr.; Mayo Clinic and Mayo Foundation, Rochester, MN. *Cancer* 47:3430-3432, 1981

As an adjunct to surgery for the treatment of endometrial carcinoma, 15 patients of 1670 treated between 1952 and 1976 received intraperitoneal Au-198 colloid instillation in a dose of 100-140 mCi in normal saline. Thirteen of these patients underwent a total abdominal hysterectomy with bilateral salpingo-oophorectomy as well as biopsy of peritoneal metastases and removal of lesions of more than 2 mm in diameter. A vaginal hysterectomy and salpingo-oophorectomy were carried out in two. The Au-198 colloid was instilled from 4 to 37 days following the initial

surgery. In addition, three of these patients received external beam therapy and one local radium therapy.

At 11 to 24 yr follow up, seven patients were alive and showed no evidence of their initial disease. Three patients died of intercurrent diseases at 14 to 16 yr after treatment and five died of cancer, two of these with local recurrence and three of distant metastases.

A Microtiter Solid Phase Radioimmunoassay for Total Serum IgE. K. V. Cheung, M. J. Reid, A. Page, N. J. Lewiston; Stanford Univ. Children's Hosp. Sch. Med., Palo Alto, CA. *Ann Allergy* 46:132-136, 1981

In their procedure, these authors describe clinical use of a flexible, polyvinyl, microtiter plate in their radioimmunoassay (RIA) quantitating serum total immunoglobulin E (IgE). Rabbit antihuman IgE antibodies are absorbed on the plate wells unaided. After an addition of 25 ml of patient serum dilution (1/10) to a well and a 12-hr room temperature incubation, ^{125}I -goat antihuman IgE was added to wells and incubated a further 12-24 hr. The wells then were washed, cut apart, and measured for radioactivity in a gamma counter. The sensitivity of this RIA is reported to be 0.07 U IgE/ml. Thirty-two fresh newborn cord sera had 0.3 ± 0.13 U IgE/ml (geometric mean \pm s.d.). Sera from 40 allergic and nonallergic subjects (age 10-45 yr) had 4-593 U IgE/ml. When the latter sera were also assayed for IgE by a commercial paper radioimmunosorbent test (PRIST procedure), a correlation coefficient of +0.984 ($p < .001$) between method results was achieved. Since chemical coupling of first antibody to plate wells is not required, danger of chemical denaturation is avoided, simplifying the assay procedure. The authors find that the first incubation period can be conveniently shortened to 4 hr, yielding a total assay time of 24 hrs. In addition to this low cost, this method is reportedly well suited to multisample analysis.

Rapid Radioimmunoassay Diagnosis of Legionnaires' Disease—Detection and Partial Characterization of Urinary Antigen. R. B. Kohler, S. E. Zimmerman, E. Wilson, S. D. Allen, P. H. Edelstein, L. J. Wheat, A. White; Indiana Univ. Med. Ctr., Indianapolis, IN. *Ann Int Med* 94:601-605, 1981

These authors employed their sandwich-type, solid-phase radioimmunoassay (RIA) to detect *Legionella pneumophila* antigen(s) in urine from patients having serogroup 1 Legionnaires' disease (LD). For RIA, 0.1 ml test urine was added to a polystyrene tube precoated with rabbit antilegionella immunoglobulin G (RALIGG). Tube liquid contents were aspirated after a 1-hr incubation. Then, 0.1 ml radiiodinated RALIGG was added to each tube, incubated 1 hr, and finally aspirated. After measuring tubes for radioactivity in a gamma counter, a ratio of test urine to control urine (latter derived from patients known not to have LD) result was computed and considered positive if ≥ 2.0 . All nine patients with confirmed and clinically moderate to severe LD had positive results by RIA before and through at least 2 days after starting erythromycin therapy. Negative results by RIA were obtained on urines from: (a) all 100 patients having urinary tract infections or contaminated urine; (b) all 26 patients having non-LD pulmonary diseases; (c) all 50 patients having bacteremic infections; and (d) all 65 patients having miscellaneous conditions and no or insignificant growth on urine culture. All positive results by RIA could be specifically inhibited by premixing LD urine with antilegionella antiserum before RIA. Preliminary findings suggest that urinary LD antigen(s) have a molecular weight of approximately 8000-10,000 and are stable for 30 min at 100 °C alone or in the presence of trypsin.

A Protein-Binding Radioassay for 6-Beta-Hydroxycortisol: Detection in Pregnancy Urine and Amniotic Fluid. S. J. Bowler-Wong, D. M. Hay, F. L. Lorscheider; Univ. of Calgary, Faculty of Medicine, Alberta, Canada. *Am J Obstet Gynecol* 139:243-249, 1981

6 β -hydroxycortisol (6 β -OHF), a polar metabolite of cortisol, is the most abundant unconjugated corticoid in human urine that increases further during pregnancy, assumedly from influence of estrogens. These authors extracted 6 β -OHF from human urine and amniotic fluid and purified it by column chromatography. Isolated 6 β -OHF was then quantitated by a competitive protein-binding radioassay using corticosteroid-binding globulin derived from dog plasma and labeled with ^3H -cortisol. Sensitivity of the 6-hr radioassay was 3.2 ng 6 β -OHF/ml urine and 1.9 ng/1 ml amniotic fluid. Intra-assay and interassay precision was 12.5% and 12.9%, respectively. Mean levels of 6 β -OHF in 24 hr urine collections from normal control males (300 μg), nonpregnant females (313 μg), or nonpregnant females receiving estrogenic oral contraceptives (227 μg) were not significantly different from each other. In pregnant women, urinary 6 β -OHF rose from 430 μg ($p < 0.10$ compared with controls) during the first trimester to 863 μg ($p < 0.01$) during the third trimester. Amniotic fluid rose from 5 ng/ml in first trimester to 19 ng/ml ($p < 0.002$) during the third. The authors claim the radioassay to be a reliable laboratory method for measurement of 6 β -OHF in high-risk pregnancies and in selected endocrinopathies.

An Initial Experience With Post-Data Processing in Hepatic Sonography. M. E. Bernardino, J. L. Thomas, G. B. Mayes; University of Texas Cancer Center, M.D. Anderson Hospital, Houston, TX. *Am J Roentgenol* 136:521-525, 1981

Electronic manipulation of the normally assigned gray-scale curve produced better visualization of hepatic metastases in ten of 28 abnormal scans either by emphasizing the normal liver parenchyma, thereby accentuating the sonolucency of the metastasis, or de-emphasizing the normal liver parenchyma and allowing the slightly increased echogenicity of the metastasis to become manifest. In no case, however, was a lesion seen following post-data processing that was unrecognizable on the original linear gray-scale scan. Some ease of recognition of the hepatic metastases is frequently achieved with the application of post-data processing curves, but the authors caution that the creation of a "pseudolesion" represents a definite danger, particularly as the slope of the compressed curve becomes steeper. Representative images and sample curves are presented; the authors suggest that curves specific for hepatic parenchyma may add value to this technique in the future.

Assessment of Gestational Age in the Second Trimester by Real-Time Ultrasound Measurement of the Femur Length. G. D. O'Brien, J. T. Queenan, S. Campbell; Kings College Hospital, London, England. *Am J Obstet Gynecol* 139:540-545, 1981

In a series of 47 cases the authors measured the length of the femur, using a multitransducer real-time imaging device with electronic calipers. Reproducible measurements were required within 2 mm of one another to produce an average length, which was found to correspond with the radiographic length of the femur on specimens radiographed to within 1 mm. Good correlation between femoral length and menstrual age was attained, and the gestational age could be predicted within ± 6.7 days with a 95% confidence limit. Scanning and measuring techniques are described and graphic representation of femoral length plotted against menstrual age is provided.

Ultrasonographic Diagnosis of Portal Cavernoma in Children: A Study of Twelve Cases. C. Sassoon, P. Douillet, A. M. Cronfaut, M. Odievre, P. Chaumont, D. Doyon; Clinique de Pédiatrie, Hôpital d'Enfants, Bicetre, France. *Br J Radiol* 53:1047-1051, 1980

Ultrasonographic study of 12 children with portal cavernoma demonstrated several abnormal patterns in the region of the portal vein. Most commonly, a collection of several smaller linear echoes dotting the area of the portal vein was seen, and the division of the portal vein into right and left branches could not be demonstrated in any of the 12 patients. In only three of the 12 patients was a visible portal vein defined, and ultrasonographic and angiographic findings correlated well. The finding of a normal proximal portal vein led to a misinterpretation as normal when cavernous transformation of the distal portion of the vessel was found angiographically. Representative ultrasonograms and angiographic study are provided.

Aortic and Lower Extremity Arterial Aneurysms. J. H. Hirsch, B. L. Thiele, S. S. Carter, C. Colacurcio; Seattle V.A. Hospital, Seattle, WA. *J Clin Ultrasound* 9:29-31, 1981

A prospective study of patients referred for both peripheral

lower extremity arterial aneurysms and abdominal aortic disease demonstrated that lower extremity arterial aneurysms were infrequently discovered in patients referred for suspected abdominal aortic aneurysm. When the clinical suspicion was that of femoral or popliteal aneurysm, however, multiple other peripheral arterial aneurysms were frequently identified. Popliteal aneurysms were associated with other peripheral arterial aneurysms in 75% of the patients and 58% of those had abdominal aortic aneurysms as well. The authors conclude that if the femoral or popliteal aneurysm is suspected or discovered, a complete survey of the vessels, including abdominal aorta, iliac, and femoral, should be carried out. If an abdominal aortic aneurysm is the sole vascular abnormality suspected, only the abdominal aorta need be scanned.

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