

## ABSTRACTS OF CURRENT LITERATURE

**Bronchoalveolar Lavage, Serum Angiotensin-Converting Enzyme, and Gallium-67 Scanning in Extrathoracic Sarcoidosis.** B. Wallaert, P. Ramon, E. Fournier, A. B. Tonnel, C. Voisin; Lille, France. *Hosp.*, Albert Calmette, Lille, France. *Chest* 82:553-555, 1982

An early manifestation of pulmonary sarcoidosis is alveolitis. Standard radiologic and pulmonary function tests are poorly correlated with the intensity of alveolitis as assessed by histopathologic studies. Bronchoalveolar lavage (BAL), Ga-67 scanning, and serum angiotensin converting enzyme (SACE) may provide a sensitive and specific means of assessing the activity of the disease. Ten patients with extrathoracic sarcoidosis were included in the study. BAL demonstrated an increased alveolar lymphocytosis in 8 of 10 cases; SACE levels were increased in 2 cases. Nine of 10 cases underwent Ga-67 scan but the thoracic gallium uptake was normal in all cases. It was concluded that BAL appears to be the best technique for diagnosing latent pulmonary involvement in extrathoracic sarcoidosis.

**Postural Changes in Pulmonary Blood Flow in Pulmonary Hypertension—A Noninvasive Technique Using Ventilation Perfusion Scans.** M. Horn, W. Hooper, B. Brach, W. Ashburn, K. Moser, Univ. California, San Diego, CA. *Circulation* 66:621-626, 1982

Pulmonary perfusion scintigraphy was evaluated for the detection and quantitation of elevated pulmonary artery pressures in 12 normal subjects and in ten patients with precapillary pulmonary hypertension. The patient group underwent right heart catheterization within 6 hr before radionuclide scanning. The radionuclide studies utilized a gamma camera interfaced to computer with data collection in a 64 X 64 matrix and consisted of four parts: (a) data collection following the injection of 1 mCi of technetium-99m labeled human albumin microspheres (Tc-99m HAM) in the supine position; (b) similar data collection following a second Tc-99m HAM injection in the upright position; (c) a 2-min background count of Tc in the xenon-133 window; followed by (d) an equilibrium ventilation scan using Xe-133. Blood flow per unit volume of lung in the upper and lower thirds (U:L zone ratio) was determined for the upright and supine positions, and the percent change in this ratio on assumption of the upright posture determined. All normal subjects had a greater than 50% shift in U:L zone ratio after assumption of the upright position while patients had only  $19.0 \pm 17.4\%$  shift ( $p < 0.0001$ ). Supine U:L zone ratio in patients was  $1.11 \pm 0.69$ , significantly different from normals ( $0.70 \pm 0.05$ ) ( $p < 0.05$ ). Patients also had upright U:L zone ratios that differed significantly from normals ( $0.90 \pm 0.63$  compared with  $0.20 \pm 0.08$ ) ( $p < 0.005$ ). A statistically significant inverse correlation existed between the postural change in the U:L zone ratio and parameters of pulmonary vascular pressure.

**Longterm Follow-up of Patients with Suspected Pulmonary Embolism and a Normal Lung Scan.** M. S. Kipper, K. M. Moser, K. E. Kortman, W. L. Ashburn; Univ. California, San Diego, CA. *Chest* 82:411-415, 1982

The validity of the assumption that a normal lung perfusion scintigram excludes the diagnosis of pulmonary emboli was evaluated by clinical follow-up of 68 patients who were referred for suspected pulmonary emboli but who had normal scans. The patients ranged in age from 22 to 80 yr (average 51.0 yr), 63 (93%)

were men. Documented heart disease was present in 33 (49%); 12 (18%) had a history of surgery and/or immobilization less than one month before the scan, 38 were smokers, six had a previous history of thrombophlebitis, and three had current malignancy. Pleuritic chest pain, dyspnea, and cough were frequent; four had hemoptysis; and most had mild to moderate hypoxemia. Anticoagulant therapy was used in only one patient who had demonstrated deep-venous thrombosis at the time of the study. The period of follow-up ranged from 2-97 mo (average 30.2 mo). Analysis of the follow-up data revealed that the 95% confidence interval for the probability of a false-negative perfusion scan result extends from 0 to 5.3%. If four additional patients who had no follow-up records are added to the group of 68, and if all four are assumed to have had emboli, the probability of a false-negative scan is 2-14%. It was concluded that a normal perfusion scan does effectively exclude the diagnosis of pulmonary emboli and appears to have the same value as does an appropriately performed and interpreted pulmonary angiogram.

**Use of Pulmonary Angiography for Suspected Pulmonary Embolism—Influence of Scintigraphic Diagnosis.** H. D. Sostman, C. E. Ravin, D. C. Sullivan, S. R. Mills, M. G. Glickman, G. S. Dorfman; Yale New Haven Hospital, New Haven, CT. *Am J Roentgenol* 139: 673-678, 1982

The influence of the scintigraphic diagnosis on the use of pulmonary angiography in cases of suspected pulmonary embolism was studied in 60 consecutive cases drawn from the patient population of the Duke University and Yale-New Haven Medical Centers. Significantly more "normal" ventilation/perfusion results were obtained at Yale ( $p < 0.001$ ), but in the category most likely to lead to angiography (moderate probability/indeterminate) there was no significant difference ( $p > 0.10$ ) between the two institutions. In patients undergoing angiography without prior lung scan, one-third had positive angiography results. One patient with a normal ventilation/perfusion study had normal angiographic results; one of seven patients with low probability scintigraphic findings had positive angiographic results; angiograms performed for moderate probability and indeterminate scans were positive in 33% (4/12) and 27% (9/31) of cases, respectively, a difference not significant ( $p > 0.10$ ). Angiography was done in 9.4% (6/64) patients with high probability scintigraphy with positive results in three. In the moderate probability-indeterminate category, 57% of the patients were treated without angiography (14 fully anticoagulated, one briefly anticoagulated pending repeat scan, and 42 not anticoagulated). Angiography was not ordered in this group for diverse reasons, and suggests that the selective basis on which angiograms are requested will introduce significant bias into studies comparing scintigraphic and angiographic results.

**An Improved Method of Right Ventricular Gated Equilibrium Blood Pool Radionuclide Ventriculography.** D. Morrison, J. Marshall, A. L. Wright, M. Daly, R. Henry; Vet. Admin. Med. Ctr, Tuscon, AZ. *Chest* 82:607-614, 1982

There are two methods for performing radionuclide ventriculography: first-pass and gated-blood pool (GBP). The first-pass method has been well established to calculate the right ventricular ejection fraction (RVEF), however, multiple interventional studies

are impractical because the first-pass method requires a separate injection of radionuclide for each study. GBP ventriculography of RV has suffered from several technical problems, mainly because of the presence of radioactivity in all four cardiac chambers simultaneously. The authors described a new method of RV blood pool analysis that attempts to solve these problems using well-established concepts for LV blood pool analysis: (1) variable regions of interest; (2) computer edge detection with operator intervention; and (3) computer selected background. In forty-seven consecutive GBP studies originally obtained for analysis of LV function, 22 patients had gated first-pass studies. The results showed a strong linear correlation between RVEF first pass and RVEG of GBP study. There was also a strong linear correlation between LV and RV stroke counts in patients without valvular regurgitation, intracardiac shunts, or ventricular aneurysm. The authors concluded that this method is suitable for analysis of rest, exercise, and intervention studies of RV function.

**Thallium-201 Scintigraphy for Detection of Multivessel Disease in Patients with Prior Inferior Myocardial Infarction.** V. S. Barbrah, M. H. Kellan, Jr., J. S. Soin, J. G. Llaurodo, R. D. Siegel, D. D. Tesch, F. E. Instani, H. L. Brooks; Vet Adm. Med. Ctr. Wood, WI. *Chest* 82:581-589, 1982

To evaluate the diagnostic capability of Tl-201 imaging for identifying multivessel disease in patients with previous myocardial infarction, Tl-201 perfusion scintigraphy, exercise electrocardiogram (EKG), and coronary arteriography were performed in 89 patients with prior inferior wall myocardial infarction (MI). Of 80 patients who performed an adequate exercise test, 57 had documented multivessel disease (MVD) by coronary angiography, and 23 had single-vessel disease (SVD). Of the 57 patients with MVD, Tl-201 correctly predicted multivessel disease in 58% and the exercise ECG was positive in 63%. Of the 23 patients with SVD Tl-201 was negative in 91%, while the ECG was negative in only 52%. Combination of the two tests for detecting MVD increased the sensitivity to 82%, but decreased the specificity to 48%. The predictive value of positive Tl-201 for MVD was 94% as compared with 76% for exercise ECG. It was concluded that both Tl-201 scanning and exercise ECG were limited by relatively low sensitivities for detecting MVD in patients with postinferior myocardial infarction.

**Temporal Fourier Analysis Applied to Equilibrium Radionuclide Cineangiography. Importance in the Study of Global and Regional Left Ventricular Wall Motion.** J. C. Cardot, P. Berthout, J. Verdonet, A. Bidet, T. Faivre, J. P. Bassand, R. Bidet, J. P. Maurat; Nuclear Medicine and Cardiac Unit, C.H.U. St-Jacques, Besancon, France. *Eur J Nucl Med* 7:353-358, 1982

The authors assessed left ventricular wall motion by radionuclide cineangiography (RCA) after applying Fourier analysis to the data and to contrast angiography. Of 120 patients included in the study, 94 suffered from coronary heart disease, 21 from valvular heart disease, and five from other cardiopathies. In 57 patients the global left ventricular ejection fraction was calculated in RCA (in LAO position) and contrast angiography. A correlation coefficient of 0.90 was found. The intraobserver error and interobserver error were as low as  $0.2\% \pm 1.8\%$  and  $0.6\% \pm 1.8\%$ . Wall motion was assessed and compared in 63 patients. An abnormal wall motion was observed by contrast angiography in 54 patients and the RCA was concordant with contrast angiography in 51 of these patients. (94% true positive). False-negative results were obtained in three patients (6%). Regional wall motion was assessed in the 54 patients with abnormalities. Twenty-three of these patients had undergone single-plane contrast ventriculography in RAO at 30° and 31 patients had biplane ventriculography. A poor sensitivity

(56%) for RCA was found when the abnormal segments were compared. In LAO only two false-negative cases were seen. The authors note that a segmental abnormality can be observed in 88% of the patients in both angiographic views or in the RCA (LAO view) alone. In 12% of the cases the abnormality was observed only in the RAO. Both views, LAO and RAO, are necessary for the assessment of left ventricular function.

**Preoperative Localization of Space-Occupying Lesions by Isotope Scanning.** M. P. Powell, D. T. Hope, H. B. Coakham, P. A. Smith; Frenchay Hosp, Bristol, BS16, ILE, Avon, England. *Surg Neuro* 18:250-253, 1982

After transmission computerized tomography (TCT) identification of a brain lesion for exploratory operation, 20 mCi Tc-99m glucoheptonate (Tc-GH) was given i.v. Ninety min later, the patient was imaged by gamma camera in true lateral projection (with the lesion site uppermost), and the tumor viewed on the persistence oscilloscope. A 100- $\mu$ Ci Co-57 "pencil" line source was then moved slowly in from the periphery toward the scalp (with progress monitored on the scope) until the pencil shape overlies the tumor blush (the pencil point should touch the scalp). When the pencil point was centered within the tumor image, an indelible mark was made on the skin. Location mistakes were rectified rapidly by clearing the persistence scope and beginning anew. As a confirming check, a lead disk of 1-cm diameter and 3-mm thickness was taped over the skin mark, and a conventional lateral image obtained. The skin mark served as the centerpoint for surgical approach to the lesion. For vertex or deep lesions, imaging was repeated in the vertex projection and a vertex mark made on the scalp. In the latter case, the two points can be used as vectors in burrhole biopsies or in planning craniotomy flaps. In the year 1980 (before use of this localization method), burrhole biopsy and craniotomy yielded failure in seven of 39 cases (18%) and in six of 69 cases (9%), respectively, for an overall success rate of 88%. In contrast, use of this localization method from Jan. to July, 1981, yielded no failures in 25 burrhole biopsies and no failures in 25 craniotomies, for an overall operative success rate of 100%. In the latter time period, one astrocytoma failed to concentrate Tc-GH. These authors feel that their isotope localization technique was superior to TCT localization techniques because it provided greater accuracy of localization and permitted smaller surgical exposures, thereby decreasing operating time, postoperative recovery, and morbidity. In addition, the radionuclide technique reduced the incidence of brain herniation through the defect of a larger craniotomy.

**Liver Biopsies vs Liver Scans in Methotrexate-Treated Patients with Psoriasis.** R. G. Geronemus, R. Auerbach, H. Tobias; New York School of Medicine, New York, NY. *Arch Dermatol* 118:649-651, 1982

These authors retrospectively compared the results from percutaneous liver biopsy with those from Tc-99m sulfur colloid liver images in 24 patients (13 women), age 27-70 yr (mean 53) with refractory psoriasis who had received a total of 0.8 to 4.0 gm of methotrexate over a period of 1 to 5 yr. Historically, the most notable long-term side effect of such therapy is hepatotoxic reaction. Only patients with psoriasis and free from other diseases that might affect reticuloendothelial function were included. In 23 of the 24 cases, biopsy and scan were performed within two weeks of each other. Abnormal radionuclide liver studies (comprising heterogeneous uptake, hepatomegaly, and/or extrahepatic uptake) were found in six of 17 patients with biopsy specimens classified histologically as grade 1 or 2 (normal or fatty infiltration). Three of five images from patients with grade 3 biopsy specimens (fibrosis) were judged normal. Two patients with grade 4 biopsy findings (cirrhosis) demonstrated heterogeneous uptake and extrahepatic

uptake by imaging. There were no focal defects on the nuclide studies in any of the 24 subjects. These authors conclude that hepatotoxic reactions from long-term methotrexate therapy cannot be reliably evaluated by Tc-99m sulfur colloid liver imaging. Perhaps a radiopharmaceutical more sensitive to hepatocellular dysfunction may prove useful for such evaluation. The authors feel that serial liver biopsies performed every 1 to 2 yr remain the most reliable and effective method for assessing long-term treatment of psoriasis by methotrexate.

**Clinical Comparison of Two Bonesseeking Phosphate Complexes: Methylenediphosphate—Diphosphonopropandicarboxylic Acid.** M. Fischer, U. Gerlach; Clinic of Internal Medicine, University of Muenster, West-Germany. *NucCompact* 13:121-122, 1982

Twenty patients suffering from primary bone tumor or metastatic disease to bone were each examined twice, once with methylenediphosphate (MDP) and once with diphosphonopropandicarboxylic Acid (DPD). The radiopharmaceutical was labeled with 6 mCi Tc-99m, administered 30 min later, and images were obtained two hours later. The assessment of lesions was visually performed and with the region of interest (ROI) technique. For this purpose ROIs were placed over a lesion and normal bone tissue and the count density within the ROI was calculated. The relative concentrations of radiopharmaceuticals were assessed by comparing the quotients of the count density of the lesion with the normal bone. The authors found a mean count density quotient of  $3.1 \pm 3.2$  for MDP and  $2.9 \pm 3.1$  for DPD. Statistical analysis revealed no significant difference. The same number of lesions were identified with MDP and DPD and no visual differences in lesion recognition were seen. With MDP and DPD primary tumors and metastases were visualized with the same contrast to normal bone. A difference between the two radiopharmaceuticals might exist if the bone/soft tissue quotients were compared. Thus DPD might be from value in the three-phase scintigraphy.

**Thyroxine and Triiodothyronine Equilibrium in Human Normal and Leukemic Leukocytes.** A. Notario, E. Petrucci, M. T. Zocchi, D. Pricca; Institute of General Medical Clinic and Therapy, University of Pavia, Pavia, Italy. *J Nucl All Sci* 26:9-14, 1982

The level of triiodothyronine (T<sub>3</sub>), reverse-T<sub>3</sub> (rT<sub>3</sub>) and thyroxine (T<sub>4</sub>) in leukocytes was measured by means of a radioimmunochemical method with double antibodies on intact cells. The study was performed with leukocytes isolated from the peripheral blood of 20 normal persons, 15 patients suffering from chronic myeloid leukemia (CML), 13 patients with acute myeloid leukemia (AML), 12 with chronic lymphatic leukemia (CLL) and 7 patients with acute lymphatic leukemia (ALL). The authors found an intracellular content of T<sub>3</sub> almost double that of T<sub>4</sub> (T<sub>3</sub>:T<sub>4</sub> ratio  $1.88 \pm 0.39$  in granulocytes and  $1.69 \pm 0.35$  in lymphocytes). Polymorphonucleates demonstrated a somewhat lower concentration of hormones than lymphocytes. In CML the content of T<sub>3</sub> was reduced to approximately 50% of that in normal cells. The T<sub>4</sub> and rT<sub>3</sub> concentrations showed no statistically significant change. The T<sub>3</sub>:T<sub>4</sub> ratio was lowered to  $1.11 \pm 0.21$ . Furthermore, the T<sub>3</sub>, T<sub>4</sub> and rT<sub>3</sub> content was lowest in AML (T<sub>3</sub>:T<sub>4</sub> ratio  $0.45 \pm 0.15$ ). All three hormone levels decreased in CLL and ALL. While in CLL the T<sub>3</sub>:T<sub>4</sub> ratio was in the normal range ( $1.23 \pm 0.28$ ), in ALL a lowered ratio of  $0.85 \pm 0.23$  was observed. Different explanations were proposed for this reduction of hormone content, such as an increase of the intracellular turnover of the thyroid hormones or a reduced uptake of the hormones secondary to an alteration of the membrane and cellular receptors. The change of the T<sub>3</sub>:T<sub>4</sub> ratio is partially in agreement with data reported on hepatoma cells. The authors propose a reduction of the T<sub>4</sub> me-

tabolism in leukemic cells and consequent decrease in its intracellular transformation to T<sub>3</sub> receptors.

**Multimage Formatting—Effect on Scintillation Image Quality.** W. A. Fajman, R. Sarper; Emory University School of Medicine, Atlanta, GA. *Am J Roentgenol* 139:751-754, 1982

The fidelity with which analogue multiimage formatters translate count density into film density was assessed in three multiimagers: a Searle Microdot 3132 coupled to a Searle LFOV camera, a Toshiba Gamma Imager GMI-04A coupled to a Toshiba Jumbo GC40A camera, and a Matrix Multiimager 4 coupled to a Picker Dynacamera 4/15 camera with micro-Z field uniformity correction. Each imager was tested throughout the entire range of formats using a 1 mCi Co-57 sheet source for density uniformity testing and a Rollo phantom filled with 5 mCi of Tc-99m for studies of image contrast. Data were simultaneously recorded on Kodak NMB film and digitally in a 64 × 64 pixel matrix on a computer. Scattergrams were prepared relating count density and film density as the number of standard deviations of each image from the mean count density for the series plotted against the number of standard deviations of each image from mean film density for the series. None of the three devices tested accurately translated counts to film density throughout the entire series of images. Correlation values were: Toshiba Gamma Images,  $r = -0.00023$ ; Matrix Multiimager 4,  $r = 0.111785$ ; Searle Microdot,  $r = -0.00725$ . Multiimage formatters may produce aberrations adversely affecting image quality and must be considered in the critical evaluation of gamma camera output.

**Analysis of Anger Camera Flood Field Uniformity Based on Order Statistics.** W. W. Wooten, L. S. Graham, R. S. Plourde; V. A. Medical Center, Sepulveda, CA and UCLA School of Medicine, Los Angeles, CA. *Med Phys* 9:41-51, 1982

A definition is offered for flood field uniformity that is similar to most definitions for uniformity: the maximum pixel minus the minimum pixel divided by the average pixel. The authors assume, however, that each pixel count observed in a flood image comes from a Poisson distribution about the same mean. Each pixel then has a mean value associated with it and the uniformity is defined in terms of these mean values. The authors further assume that the pixels are independent and that the distribution of mean values for all pixels in the flood has the shape of a truncated Gaussian. With these assumptions, any flood field image stored in an on-line computer can be used to estimate uniformity and an associated confidence interval for uniformity. The confidence interval reflects the Poisson statistics expected in each pixel. As the total counts in the flood increases, the confidence interval for uniformity gets narrower. This method is more versatile and at the same time more difficult to use than, for example, the NEMA method, which ensures that statistical fluctuations will be sufficiently small by specifying that there be at least a minimum number or counts per pixel in the center of the flood and that a nine-point smooth be performed.

**Effect of Window Width and Viewing Distance in CT Display.** R. C. Warren, Y. V. Pandya, The Middlesex Hospital School and Queen Elizabeth College. *Brit J Radiol* 55:72-74, 1982

Although this article deals directly with optimum conditions for viewing transmission tomographic computerized images, the increasing use of computers for displaying planar and emission tomographic nuclear images makes it relevant to nuclear medicine. For this study a resin object with an attenuation coefficient lower than water was immersed in a water bath and imaged with an EMI

TCT 5005 body scanner operated at 140 keV. Various window widths were used, and images were produced on sheet film. These films were viewed at various distances. Each image was presented for 10 sec and the observer reported his decision on a 5-point rating scale. At the end of the viewing sessions, true-positive and false-positive fractions were calculated and used to produce receiver operating characteristic (ROC) curves. In addition, an index of detectability was calculated. The results indicated that detectability increased with decreasing window width and that detectability increased with increasing viewing distance up to a maximum value, and then decreased. It was found that the optimum viewing distance depended on the window width and was lower for high window widths. For small window widths, the observer noise level was insignificant compared with the image noise level, whereas for large window widths, the observer noise was significant and detectability was reduced. The distance at which the maximum detectability occurred depended on the original image noise level, which in turn depended on the window width. When the window width was small, the original image noise level was high and the observer noise only became dominant at larger viewing distances. For large window widths where the image noise level was low, the observer noise became dominant at shorter viewing distances. This information may be helpful in other modalities, but the authors warn: "Extension of the results of this study to other applications will depend on the properties of the imaging system, the scan conditions, and the object being imaged."

**Factors Affecting the Trapping Performance of Xenon Holdup-Filters in Nuclear Medicine Applications.** M. S. Bolmsjo, B. R. R. Persson; University of Lund, Lund, Sweden. *Med Phys* 9:96-105, 1982

A mathematical model is used that predicts the behavior of a single bolus of xenon input to a charcoal trap. The model contains three unknown parameters:  $K$ , which represents the adsorption capacity of the charcoal; a number  $N$ , which represents the number of compartments in the trap (these are not physical compartments); and  $V_b$ , which represents the total volume of air pumped through the trap before the bolus begins to be significantly discharged.

Three traps were experimentally tested under different conditions. The experimental data fit very well to the mathematical model. Two of the traps tested were commercially available and designed to be used at room temperature. The third trap was custom built and was maintained at  $-20^\circ\text{C}$ . All three traps were effective for clinical purposes. The refrigerated trap had a  $V_b$  better than twice as great as the  $V_b$  of the two room temperature traps. Moisture in the air pumped through the room temperature traps caused a strong deterioration in the ability to trap and hold xenon.  $\text{CO}_2$  in the air pumped through the traps caused mildew, but significant deterioration. The rate of gas flow through the traps had very little effect on the performance of the traps between 2 and 17 liters per minute.

**Nuclear Magnetic Resonance Imaging: The Current State.** A. E. James, C. L. Partain, G. N. Holland, et al; Vanderbilt University, University of Nottingham, Royal Post Graduate Medical School, University of Arkansas. *Am J Roentgenol* 138:201-210, 1982

The unique chemical and structural information available in nuclear magnetic resonance (NMR) analysis has led to its present state of importance as an imaging modality. This article begins with a brief review of the basic physics and includes a description of the principles of NMR imaging and useful diagrams illustrating how  $T_1$  and  $T_2$  relaxation times are measured. In addition, methods for obtaining positional information using static gradients are

presented.

The authors point out that inherent limitations in the signal-to-noise ratio indicate that images will probably not be acquired with the same speed as for transmission CT. However, this limitation is offset by the ability to produce unique images of soft tissue.

Brief discussions related to the choice of magnets, display, and image reconstructions are also presented. A section on the clinical uses of NMR covers its potential for differentiating gray and white matter, cancer detection, blood flow, and imaging other nuclei such as P-31. Finally, the risks of NMR are considered. Magnetic fields used in NMR are not believed to be biologically significant. Although the rapidly changing magnetic fields that are present may represent a more serious biologic hazard, preliminary experiments have not indicated there is a problem. However, patients with surgical implants, cardiac pacemakers, and certain prosthetic devices should be handled with caution.

**Ultrasound Patterns of Metastatic Tumors in the Gallbladder.** G. Phillips, R. Pochaczewsky, J. Goodman, S. Kumari; Long Island Jewish-Hillside Medical, New Hyde Park, NY. *J Clin Ultrasound* 10:379-383, 1982

In eleven cases of metastatic disease to the gallbladder four ultrasonographic patterns were described that included focal thickening, an intraluminal mass without acoustical shadowing, a combination of these first two patterns, and a gallbladder with indistinct walls and low level irregular echoes throughout. The patterns described and illustrated were essentially identical to those previously reported by the same authors in patients with primary carcinoma of the gallbladder; however, gallstones were present in 80-90% of those patients with primary neoplasm of the gallbladder and in only 9% of those with metastatic disease. Pancreatic carcinoma was the most common source of metastasis to the gallbladder in the current series. Sonograms and line diagrams were provided.

**Ultrasonographic Patterns in Hepatic Hemangiomas.** P. Mirk, L. Rubaitelli, M. Bazzocchi, P. Busilacchi, et al; Universita Cattolica del Sacro Cuore, Rome, Italy. *J Clin Ultrasound* 10:373-378, 1982

In a review of 21 cases of hepatic hemangiomas, the authors encountered a hyperechoic focal area in 14 patients. In five cases, larger hemangiomas produced a complex sonographic pattern and in two hemangiomas were found to mimic cysts. The hyperechoic pattern was frequently rounded or lobular whereas the contours in the complex hemangiomas were often poorly defined. Fourteen of the 21 reported cases were discovered as incidental findings, and in no patient were any clinical symptoms considered referable to the hemangiomas. In 16 patients the lesions were single and in 5, multiple. Only in the case of a hyperechoic lesion with no symptoms or derangement of the liver function studies can the diagnosis of hemangioma be made with relative confidence. Representative scans and correlative angiograms were provided.

**Sonography of Tumefactive Biliary Sludge.** J. Fakhry; Westchester County Medical Center, New York Medical College, Valhalla, NY. *Am J Roentgenol* 139:717-719, 1982

The author presented five cases in which a polypoid mass of low-level echogenicity produced by a collection of biliary sludge was discovered in the gallbladder. The mass was of essentially the same density as that of a soft-tissue tumor, nonshadowing and, in some cases, not clearly gravity dependent. Repeat examinations in four patients demonstrated disappearance of the mass and the fifth was surgically proven. This was an atypical presentation of

biliary sludge and should not be mistaken for tumor or artifact.

**Ultrasonic Evaluation of Abdominal Aortic Thrombus.** L. P. Harter, B. H. Gross, P. W. Callen, R. A. Barth, University of California Medical Center School of Medicine, San Francisco, CA. *J Ultrasound Med* 1:315-318, 1982

Sonography of abdominal aortic aneurysms in 38 patients and transmission computed tomograms (TCT) in 21 patients were reviewed. In 69% of the cases with an intraluminal thrombus, sonography demonstrated a high-amplitude linear echo at the interface between thrombus and vessel lumen. TCT scans, however, demonstrated calcification in a thrombus in only one of 21 patients but within the wall of the aortic aneurysm in all cases. The authors conclude that the bright linear echo at the thrombus-lumen interface does not represent calcification but rather a specular re-

flexion at the interface of two media to which the beam is perpendicular. This should not be mistaken for calcification and the thrombus should not be interpreted as dissection or extraluminal clot by virtue of the presence of this specular echo. Representative TCT scans and sonograms were provided.

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### Rocky Mountain Chapter Society of Nuclear Medicine 1983 Spring Meeting

April 15-16, 1983

Stouffer's Denver Inn  
Announcement

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The Rocky Mountain Chapter of the Society of Nuclear Medicine will hold its annual meeting April 15 and 16 in Denver, Colorado. The Program Committee invites the submission of abstracts of original papers for presentation. Abstracts should be of 300 words or less with the speaker indicated.

The program will include invited talks updating a range of nuclear medicine areas including SPECT instrumentation, radio-pharmaceuticals, brain, liver, kidney, gastric, and abscess studies, and monoclonal antibodies in the diagnosis and treatment of tumors.

For submission of abstracts and information contact:

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**Deadline for abstract submission is March 15, 1983**

### Eastern Great Lakes Chapter Society of Nuclear Medicine 4th Annual Meeting

May 6-7, 1983

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The 4th Annual Meeting of the Eastern Great Lakes Chapter, Society of Nuclear Medicine will be held on May 6-7, 1983, at the Niagara Hilton, Niagara Falls, New York.

Selected themes for this annual meeting will feature new approaches to Brain Imaging, G.I. Studies, and NMR. Guest lecturers will include Drs. Delmaestro, Jaszczak, Malmud, Weinstein, Weissmann, Winzelberg, and Blau.

The Technologist Program will include workshops on Camera-Computer Quality Controls and G.I. Imaging.

Original abstracts are invited (deadline March 15, 1983).

For information and registration, contact:

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