ABSTRACTS OF CURRENT LITERATURE

Astatine-211-Tellurium Radiocolloid Cures Experimental Malignant Ascites. W. D. Bloomer, W. H. McLaughlin, R. D. Neirinckx, S. J. Adelstein, P. R. Gordon, T. J. Ruth, A. P. Wolf; Harvard University & Brookhaven National Laboratory. *Science* 212:340–341, 1981

Alpha-emitting compounds appear to have potential for the treatment of malignant tumors because of the extremely localized character of the radiation, with a range of several cell diameters. The successful application of alpha-emitters depends on a high target-to-nontarget ratio to minimize radiation to normal tissues. Astatine-211 ($t_{1/2}$ = 7.5 hr), a halogen, was collected in a basic solution after preparation, then acidified and mixed with finely ground tellurium powder with which it reacted and adhered. The finely divided radioactive particles were injected into mice bearing an ascites-producing ovarian tumor. With doses between 25 and 50 μCi/mouse administered 24 hr after 10^6 tumor cells were injected, the mice were cured. Below 25 μCi, there was a semilogarithmic relationship between the surviving fraction of cells and the dose. The thyroids of the cured mice were fibrotic, reflecting some release of At-211 *in vivo;* however, this could probably be prevented with prophylactic iodine. P-32 in the same animal model had no antineoplastic effects. This method must be examined carefully for scaling problems because the dose is deposited so locally that any gross tumor would very possibly not be treated. The short half-life of At-211 prevents large radiation doses to the liver from particles that have crossed the diaphragmatic surface and been phagocytized by the liver.

Radionuclide Angiographic Evaluation of Left Ventricular Function by Resting Ejection Rate During the 1st 3rd of Systole in Patients with Chronic Aortic Regurgitation. L. L. Johnson, M. Marshall, Y. E. Johnson, R. R. Sciacca, P. J. Cannon; College of Physicians & Surgeons, Columbia University, NY. *Am Heart J* 104:92–98, 1982

It is important to detect early abnormalities of left ventricular (LV) function in patients with aortic regurgitation (AR) in order to optimize the timing of valve replacement. The authors' previous study of patients with coronary artery disease showed that the ejection rate during the first third of systole is a more sensitive indicator of LV dysfunction than indices based on total LV ejection fraction (EF). To test the hypothesis that an index of ejection rate in early systole can also identify abnormalities of LV performance in AR, the rate of change of LV counts during the first third of systole was measured by first-pass radionuclide angiography (RNV) in 34 AR patients and in normal controls. By least squares analysis a straight line was fit to the LV counts obtained at 20 or 25 msec intervals during the first systole; the slope was divided by the average counts in the first third to give a rate constant (RC) proportional to LV volume change during early systole. The AR patients were divided into two groups based upon the response of EF to exercise. Group one comprised 19 AR patients with a normal EF response to exercise (from 60 ± 9% to 70 ± 9%), and group two comprised 15 AR patients with an abnormal response to exercise (from 58 ± 9% to 52 ± 10%). The RC obtained at rest was 9.4 ± 2.8 for group two, significantly lower than for group one (15.6 ± 3.9) or controls (14.9 ± 2.6). In all 44 patients the RC from the resting study correlated significantly with the EF response to exercise. These data indicate that a noninvasive index of the rate of LV volume change during the first third of systole can identify abnormal LV response in AR patients with normal EF at rest.

Effects of Verapamil and Propranolol on Left Ventricular Systolic Function and Diastolic Filling in Patients with Coronary Artery Disease—Radionuclide Angiographic Studies at Rest and During Exercise. R. O. Bonow, M. B. Leon, D. R. Rosing, K. M. Kent, L. C. Lipson, S. L. Bacharach, M. V. Green, S. E. Epstein; NHLBI Cardiology, Bethesda, Md. *Circulation* 65:1337–1350, 1982

Oral verapamil therapy improves exercise tolerance and reduces the frequency of angina pectoris in many patients with coronary artery disease (CAD). The majority of patients with CAD have abnormalities of diastolic filling even in the absence of overt evidence of myocardial ischemia. No investigation of whether verapamil alters left ventricular (LV) relaxation and diastolic filling in patients with CAD has been undertaken. To determine the effects of verapamil on LV systolic function and diastolic filling in patients with CAD, the authors performed gated cardiac blood pool scintigrams (GCBP) at rest and during exercise in 16 symptomatic patients before and during oral verapamil therapy (480 mg/day). Twelve patients were also studied during oral propranolol (160–320 mg/day). LV ejection fraction (EF) at rest was normal in 13 of 16 patients but abnormal diastolic filling at rest (peak filling rate (PFR) <2.5 end-diastolic volumes (EDV)/sec or time to PFR >180 m sec) was observed in 15 of 16 patients. During verapamil administration resting LVEF decreased, but resting diastolic filling improved. The PFR increased (control 1.9 ± 0.6 EDV/sec, verapamil 2.3 ± 0.9 EDV/sec) and time to PFR decreased (control 185 ± 38 m sec, verapamil 161 ± 27 m sec). Exercise LFEV did not change during verapamil, but exercise PFR increased (control 3.1 ± 0.9 EDV/sec, verapamil 3.6 ± 1.1 EDV/sec) and exercise time PFR decreased (control 108 ± 30 m sec, verapamil 91 ± 17 m sec). In contrast, 12 patients on propranolol did not demonstrate altered LVEF, PFR, or time to PFR at rest or during exercise. Thus, LVEF is decreased by verapamil at rest but is unchanged during exercise. Whereas LV systolic function is not improved by verapamil, LV diastolic filling is enhanced by verapamil both at rest and at exercise. These mechanisms may account in part for the symptomatic improvement in many patients during verapamil therapy.

Comparative Effects of Oral Verapamil and Propranolol on Exercise-Induced Myocardial Ischemia and Energetics in Patients with Coronary Artery Disease-Single Blind Placebo-Crossover Evaluation Using Radionuclides. M. A. Josephson, H. S. Hiecht, J. Hopkins, J. Guerrero, B. N. Singh; Wadsworth Vet. Adm. Hosp., Los Angeles, CA. *Am Heart J* 103:978–985, 1982

To evaluate the comparative effects of oral verapamil (480 mg/day) and propranolol (320 mg/day) on left ventricular ejection fraction (LVEF) and regional wall motion (RWM) abnormalities at rest and during exercise, 15 patients (all male, ages 34 to 68 yr) with coronary artery disease (CAD) were studied. The alterations induced by the drugs in regional and global LV performance were

correlated with the effects on the gross indices of myocardial oxygen consumption in relation to their plasma drug levels, gated cardiac blood pool imaging, and single-fluid placebo crossover protocol. In patients on placebo (before verapamil) the mean LVEF fell from a resting value of 0.54 ± 0.09 to 0.47 ± 0.12 during exercise; on verapamil (plasma level 283 ± 150 ng/dl and norverapamil 220 ± 97 ng/dl) the corresponding values of LVEF were 0.54 ± 0.11 and 0.53 ± 0.13. On placebo before propranolol, exercise reduced the LVEF from 0.54 ± 0.11 to 0.48 ± 0.14; on propranolol (plasma level 144 ± 59 ng/dl) the resting LVEF was 0.54 ± 0.11 and exercise LVEF 0.52 ± 0.13. Both drugs reduced the exercise-induced RWM (infra-apical abnormality and ST segment depression) but the changes were only significant in the case of verapamil therapy. Verapamil reduced heart rate, and heart rate × blood pressure significantly less than did propranolol. The authors suggested that verapamil and propranolol exhibit comparable potency in reducing ischemic consequences of exercise stress in CAD patients. In the case of propranolol the beneficial effect was accountable in terms of a reduction in oxygen demand. In the case of verapamil, additional mechanisms such as those involving myocardial metabolism or primary changes in perfusion may be involved.

Lymphoscintigraphy by SC Injection of ^{67}Ga-Citrate. Y. Ito, N. Otsuka, K. Nagai, A. Muranaka, M. Yoneda, H. Terashima, S. Yanagimoto; Kawasaki Medical School, Kurashiki, Japan. *Eur J Nucl Med* 7:260–265, 1982

The authors assess the use of Ga-67 citrate for lymphoscintigraphy in experimental and clinical studies. The degree of deposition in vitro of Ga-67 citrate was compared with that of Tc-99m rhenium colloid (Tc-99m-ReC) using macrophages and HeLa S3 cells. Within one hour, uptake of Ga-67 citrate increases to 0.061 ± 0.017% in HeLa S3 and 0.016 ± 0.006% in macrophages. After one hour a Tc-99m-ReC uptake of 0.025 ± 0.009% in HeLa S3 and 0.327 ± 0.053% in macrophages was measured. Whereas the accumulation of Ga-67 citrate was 3.8 greater in HeLa S3 cells than in macrophages, Tc-99m-ReC uptake in macrophages was 13 times that in HeLa S3 cells.

Fifteen patients suffering from cancer (n = 12) and malignant lymphoma (n = 3) were examined after subcutaneous injection of 0.5–2 mCi of Tc-99m-ReC. Two days later 0.2 mCi Ga-67 citrate were injected subcutaneously for lymphoscintigraphy. In all cases histology was available by lymph node biopsy. Areas of low uptake seen in the Tc-99m-ReC scans were identified as areas of increased uptake in the Ga-67 citrate scintigraphy. One case was false negative with Tc-99m-ReC whereas Ga-67 citrate showed an accumulation of nuclide. The authors concluded that a combination of Tc-99m-ReC and Ga-67 citrate lymphoscintigraphy would be valuable in the assessment of malignant involvement of lymph nodes.

Evaluation of Bone Scan by Scintigraphy to Detect Subclinical Invasion of the Mandible by Squamous Cell Carcinoma of the Oral Cavity. H. L. Baker, D. H. Woodbury, C. J. Krause, K. G. Saxon, R. C. Stewart; Vets. Admin. Med Ctr., Portland, OR. *Otolaryngology and Head and Neck Surgery* 90:327–336

A prospective comparative study was performed with panorex roentgenogram and Tc-99m MDP bone scan for the detection of subclinical invasion of the mandible by squamous cell carcinoma of oral cavity and floor of the mouth. Twenty-five patients with squamous cell carcinoma of the floor of mouth were evaluated preoperatively by both panorex and bone scan techniques and the results compared with the postsurgical pathologic findings. In 13 of 15 (52%) of the cases, panorex and bone scan techniques were comparable in detecting tumor involving bone. A positive bone scan and negative panorex was observed in four cases (16%). The authors concluded that bone scanning technique is more sensitive for the detection of early cancer involvement of mandible, that it may be a better indicator of extent of involvement, and that it may help alter the therapeutic approach.

Risk of Leukemia in Patients Treated for Hodgkin's Disease. E. Brusamolino, M. Lazzarino, L. Salvaneschi, A. Canevari, E. Morra, G. Castelli, G. Pagnucco, P. Isernia, C. Bernasconi; Divisione di Ematologia, Ospedale Policlinico San Matteo, Pavia, Italy. *Eur J Cancer Clin Oncol* 18:237–242, 1982

Intensive radiotherapy and chemotherapy has significantly increased the patient survival in Hodgkin's disease. One of the long term side effects of therapy is the higher risk of developing a second neoplasm and acute nonlymphoid leukemia. The authors analyzed the risk of leukemia, especially acute nonlymphoid leukemia, in 251 patients that had been staged according to the Ann Arbor classification. Radiotherapy was delivered as high energy irradiation to the patients in stage IA; chemotherapy alone with MOPP regimen as the primary treatment in stage IV. All other stages were treated with a combination of high energy radiotherapy and chemotherapy (MOPP regimen). ABVD or different regimens, including nitrosoureas, were given only as salvage treatment at any stage. The median follow-up time was 48 mo. No leukemias were observed in 88 patients treated with radiotherapy or chemotherapy alone. In the group of 163 patients treated with MOPP and radiotherapy (crude rate 7.5 per 1000 person-years at risk) six acute and nonlymphoid leukemias occurred. All cases were in clinical remission and off therapy. Leukemia was diagnosed 30 to 60 mo after initiation of therapy. Four of the six patients received extensive radiotherapy and combination chemotherapy with MOPP; two cases were treated with limited field irradiation followed by MOPP and procarbazine in monochemotherapy as adjuvant. The authors suggest possible direct leukemogenic role of this particular form of treatment.

Comparison of Metastatic Disease After Local Tumour Treatment with Radiology or Surgery in Various Tumour Models. J. De Ruiter, S. J. Cramer, P. Lelieveld, L. M. Van Putten; Radiogiological Institute TNO, Rijswijk, the Netherlands. *Eur J Cancer Clin Oncol* 18:281–289, 1982

An increase in metastases has been shown in experimental models after radiotherapy, but a reduction as well as no effect have also been described. Lewis lung carcinoma, 2661 carcinoma, C22LR osteosarcoma, 3641 mammary carcinoma, and R1 rhabdomyosarcoma were transplanted in the foot pad of mice and rats. When the 2661 carcinoma was involved, significantly more mice died with metastases following local radiotherapy with doses of 45 to 80 Gy than did following local amputation of the tumor-bearing foot. No significant difference was observed for the other tumors after these treatments. The enhancement of metastatic growth after local radiotherapy in the 2661 carcinoma was apparently not due to incomplete killing of tumor cells in the foot. The presence of irradiated normal structures and tumor tissue after radiotherapy promoted the outgrowth of 2661 carcinoma cells that were outside the radiation field at the time of treatment. The authors state that under similar experimental conditions radiotherapy may possibly enhance the growth of metastases from some tumors.

Radionuclide Bone Scanning of Osteosarcoma—Falsely Extended Uptake Patterns. F. S. Chew, T. M. Hudson; Univ. Florida, J. Hillis Miller Health Ctr., Gainesville, FL. *Am J Roentgenol* 139:49–55, 1982

Eighteen patients with osteosarcoma of long bones were studied to correlate histologic abnormalities with the findings seen before surgery on Tc-99m phosphate compound bone images. Twelve tumors arose in the distal femur, two in the proximal humerus, and two in the proximal tibia. None of patients received preoperative radiation therapy or chemotherapy. Seven radionuclide studies accurately represented the extent of the tumors. Eleven images revealed activity that extended beyond the true pathologic extent of the tumors. In six of 11 patients, the extended uptake of radionuclide was clearly less intense than that within the primary tumor. In five of 11 areas with extended uptake, the intensity of activity was equal to that in primary tumor, and there was no instance where the extent of the radionuclide uptake precisely paralleled the extent of the tumor. In only eight patients did the findings correlate with the explanation of extended radionuclide uptake by marrow hyperemia, medullar reactive bone, or periosteal new bone pathohistologically. The authors observed that this is the first description of these histologic abnormalities of medullary bone in areas of extended uptake on radionuclide bone scans.

The White Blood Cell Scan in Orthopedics. S. L. Propstproctor, M. E. Dillingham, I. R. McDougall, D. Goodwin; Stanford Univ. Med. Ctr., Stanford, CA. *Clin Orthop* 168:157–165, 1982

Recently, In-111 leukocyte scans have shown specificity and selectivity in the detection of abdominal, thoracic, and brain abscesses. This presentation demonstrates the accuracy of In-111 leukocyte scans in diagnosing infection of bone, joints, and soft tissues. Ninety-seven In-111 labeled autologous leukocyte scans were performed in 88 patients. The findings in 17 of 40 patients scanned for possible acute osteomyelitis— six of nine for suspected septic arthritis, and six for possible soft tissue infections—were positive. Subsequent clinical courses verified the infectious nature of these processes in all patients. Patients who had chronic osteomyelitis (*14*), bony metastases (*4*), heterotoptic ossification (*3*), and degenerative arthritis (*2*) demonstrated negative findings. Of the seven patients scanned for acute long bone fractures, one demonstrated positive findings and nine scans were positive without determined causes. Thus, the sensitivity and specificity were 98% and 89% respectively; and overall accuracy was 93%. The authors concluded that the In-111 labeled leukocyte scan represents a useful addition to diagnostic tools of the orthopedic surgeon.

Early Scintigraphic Diagnosis of Bone Stress and Fractures in Athletic Adolescents. P. R. Rosen, L. J. Mitchell, S. Treves; Univ. Texas Health Science Center, San Antonio, TX. *Pediatrics* 70:11–15, 1982

The authors retrospectively reviewed over a 40 mo period 26 episodes of stress-related abnormal scintigraphy in 25 athletic adolescents that were correlated with clinical symptoms and roentgenography. Three patterns of bone scintigraphic abnormalities were identified: (1) sharply marginated (focal); (2) ill-defined increase in uptake involving more than one third of a long bone (diffuse); (3) combinations of the diffuse and focal patterns. Twelve of 26 (46%) episodes had a multifocal pattern of abnormalities. Forty foci (tibia 12, femur 10, fibula 2, ischium 1) were identified by scintigraphy, with 11 (28%) exhibiting abnormal roentgenograms. All diffuse patterns (11) and combination patterns (3) were located in tibia. These multiple abnormalities were frequently unsuspected clinically, and studies limited to symptomatic areas would have failed to detect them. It is recommended that patients with stress-related symptoms be screened utilizing radionuclide bone scintigraphy to facilitate early detection of abnormalities in bone before development of cortical disruption, thereby preventing increased morbidity and possible disabling sequelae.

Technetium and Combined Gallium and Technetium Scans in the Neurotrophic Foot. V. J. Hetherington; Taylors, SC. *J Am Pod Asso* 72:458–463, 1982

Fourteen patients with peripheral neuropathy and ulceration of the foot (nine related to diabetes, four to alcoholism, and one of undetermined origin) were selected for Tc-99m MDP and/or combined Tc-99m MDP (Tc-MDP) and Ga-67 images. Six of 14 patients in this study were examined with Tc-MDP alone. Eight of 14 patients were imaged with both Tc-MDP and Ga-67. The Ga-67 and Tc-MDP studies were performed within one week of each other. A total of 19 clinical lesions were identified in 14 patients. Only five of the 14 patients demonstrated definite radiographic evidence of bone infection. Although a total of 18 lesions were identified radiographically, all clinical and radiographic lesions were identified on the Tc-MDP studies. Areas of activity present on the Tc-MDP images not identified clinically or by radiograph were considered silent lesions and all were determined to be noninfectious in nature. Thirteen lesions in eight patients were detected by Ga-67 studies compared with 11 lesions in eight patients that were clinically identifiable. Ga-67 uptake was not limited to infectious sites alone. From this study, the author concluded that combined Tc-MDP and Ga-67 images are helpful in the evaluation of the neurotrophic foot, however, these studies can be misleading if not combined with a complete clinical and laboratory evaluation. Direct bone biopsy or bone culture may be required to establish the diagnosis of osteomyelitis in certain cases.

Positive Indium-111 Leukocyte Scintigraphy in a Skeletal Metastasis. G. N. Sfakianakis, W. Mnaymneh, L. Ghandur-Maymneh, W. Al-Sheikh, M. Hourani, A. Heal; *Am J Roentgenol* 139:601–603, 1982

This case report describes a 67-yr-old man presenting with progressive pain and swelling in the left ankle of 2 mo duration. There was no history of trauma. Clinical examination revealed a moderately large, tender swelling over the anteromedial aspect of the left ankle and foot with erythema and warmth of overlying skin. Radiography of the left ankle revealed an osteolytic lesion in the talus. Indium-111-labeled autologous leukocytes were prepared using In-111-oxine (8-hydroxyquinoline). Scintigraphy of the feet was performed 24 hr after i.v. injection of 4.8×10^8 leukocytes labeled with 440 μCi of In-111. It showed moderate but definite hyperactivity in the region of the ankle with a doughnut-shaped appearance around the talus. Total-body scintigraphy after administration of Tc-99m-medronate showed hyperactivity around the talus with the core photopenic but no other abnormality. Ga-67 scintigraphy of the feet showed identical findings but of greater intensity than the leukocyte scans. Open biopsy of the ankle lesion found metastatic poorly differentiated adenosquamous carcinoma, probably arising from two lung lesions noted on computed tomography. Skin and subcutaneous tissues overlying tumor were edematous, but there was no evidence of infection. Microscopic examination of lesion showed a mucoepidermoid carcinoma within the talus, calcaneus, tibia, and cuboid bone with variable-sized areas of infarct necrosis. Sections taken at the areas of positive Indium-111 leukocyte scintigrams showed little inflammatory reaction with foci of necrosis and scattered lymphocytes, plasma cells, histiocytes, and necrotic neutrophils. These authors hypothesize that positive leukocyte scintigraphy may be due to (a) presence of minimal indium-111-oxine as tumor-seeking contaminant in radiopharmaceutical, (b) leukocytic infiltration, or (c) increased blood pool. If gallium image is strongly positive when

leukocyte scintigram is only faintly positive, a diagnosis of tumor is favored.

Diuretic Radionuclide Renography in Upper Urinary Tract Obstruction. M. Lichtenstein, R. Fowler, J. Andrews, G. Wood; Royal Melbourne Hosp. Parkville, Australia. *Aust NZ J Surg* 52:306–309, 1982

Dilatation of the upper urinary tract frequently presents a diagnostic dilemma (especially in childhood), when the relative contribution of obstruction, malformation or ineffective peristalsis may be hard to determine. Diuretic renography using I-131 ortho-hippurate with furosemide offers the best approach for the differentiation of obstructive and nonobstructive dilatation of the urinary tract. Sixty-seven ureterorenal units (URU) were studied in 33 patients with an age of 9.5 yr. The first part of study was done with Tc-99m DTPA and the images were obtained at 2, 5, 10, 15, 20, and 30 min. The second part of study was performed with I-131 ortho-hippurate, and images were obtained at 2, 5, 10, 20 min intervals. Furosemide was administered if an obstruction was suggested, and computer acquisition continued for an additional 20 min. The diuretic renogram correctly diagnosed 13 of 15 obstructed URU (sensitivity 87%) and 47 of 52 nonobstructed URU (specificity 90%). Four of the five false positives were related to poor URU function. One of two patients had a duplex kidney with a poorly functioning ureteric segment, and the other patient had gross reflux and megaureters. The diuretic renogram is useful in the investigation of equivocal upper urinary tract obstruction but may be unreliable in situations of inadequate renal function.

Radioactive Waste Disposal in Thick Unsaturated Zones. I. J. Winograd; *Science* 212:1457–1464, 1981

The author is proposing that there should be study of specific areas in the arid western United States where burying radioactive waste near the surface might be possible. The candidate areas are above the water table and are filled with sediments. The advantages include very low rainfall and passage of water through the sediment, high sorptive capacity of the sediments for radioactive ions, ability to control the circumstances of the burial, and accessibility of the wastes for monitoring or future exhumation. The Sedan Crater in the Nevada Test Site where the water table is 580 m below the land surface is one potential area. There are questions to be studied, some of which are also pertinent to deep waste repositories, but the low cost of this possibility makes it worth investigation.

Characterization of Plutonium in Maxey Flats Radioactive Trench Leachates. J. M. Cleveland, T. F. Rees; U.S. Geological Survey. *Science* 212:1506–1509, 1981

This article is a case report on the behavior of plutonium isotopes in the Maxey Flats, Kentucky, waste disposal site, open from 1963 to 1977. It contains an estimated 80 kg of Pu-239, as well as the ordinary collection of waste materials from research laboratories, hospitals, nuclear power stations, and commercial users. The material in the trenches is less compact than the surrounding clay soil, so the trenches act as basins for the collection of rainfall. The water (leachate) is removed by periodic pumping to prevent overflow. Samples of the leachate were analyzed including analysis of the plutonium in all its oxidation states and forms. Most of the plutonium present was in solution, suggesting that it was complexed by organic materials such as EDTA. The authors conclude from this research that it is important to prevent the formation of stable complexes of radioactive metal ions with EDTA, etc, and that the ground water should be free of complexing agents. Thus it is inadvisable to locate a chemical waste dump near a radioactive one.

Renal Transitional Cell Carcinoma: Sonographic and Pathologic Correlation. B. R. Subramanyam, B. N. Raghavendra, M. R. Madamba; New York University Medical Center, NY. *J Clin Ultrasound* 10:203–210, 1982

The authors present six cases of renal transitional cell carcinoma in which a discrete solid mass was seen, with echogenicity similar to the renal parenchyma. The mass was separated from the renal parenchyma by the densely echogenic renal sinus fat. The smallest lesion identified was 1.5 × 2.0 cm, and the authors cautioned that a smaller lesion could well be missed. Flat or plaquelike neoplasms could also escape detection and diffuse involvement of the calyces and renal parenchyma may be difficult to identify by ultrasound. Nonopaque stones, which constitute approximately 8% of renal calculi, could be distinguished easily from tumor. The finding of a solid mass within the pelvicaliceal system is not specific since a blood clot can stimulate this appearance. Examples of transitional cell carcinoma, clot, and stone are provided with pathologic correlation.

Ultrasonic Scanning During Operation for Renal Calculi. B. Sigel, J. C. U. Coelho, R. Sharifi, W. B. Waters, D. G. Spigos; University of Illinois at the Medical Center, Chicago, IL. *J Urol* 127:421–424, 1982

A high frequency (10 MHz) real-time ultrasound device was used to facilitate the intraoperative approach to renal calculi. Filling the wound with saline provided a coupling medium for the transducer used to check the position of wandering stones, identify nonopaque calculi, localize single small calculi, aiding in the passage of an exploratory needle, and identifying retained fragments after removal of staghorn calculi. Small calculi were recognized as discrete echogenic foci with distal shadowing. Diagrammatic representation of the combined sonographic and surgical approach is provided with accompanying sonograms.

Gray-scale Ultrasonic Demonstration of Peripancreatic Adenopathy. M. J. Schnur, J. C. Hoffman, M. Koenigsberg; Albert Einstein College of Medicine, Bronx, NY. *J Ultrasound Med* 1:139–143, 1982

In a study of ten patients with peripancreatic adenopathy, two major patterns were demonstrated. In five, well-defined round or ovoid masses measuring between 1 and 3 cm in diameter were noted lateral and posterior to the pancreas and anterior to the inferior vena cava, left renal vein, and aorta. In this configuration, the peripancreatic adenopathy could be separated and distinguished from primary neoplasm of the pancreas. In the remaining five, large confluent masses were noted inseparable from and frequently engulfing the pancreatic head, and this pattern proved difficult or impossible to differentiate from primary pancreatic neoplasm. The lesions were hypoechoic throughout and size was not a differentiating point. The separable nodes lying posterior to the splenic vein and splenic portal vein confluence were seen to displace those vessels anteriorly on occasion.

Real-Time Sonographic Detection of Vesicoureteral Reflux in Children. R. M. Kessler, D. H. Altman; Variety Children's Hosp., Miami, FL. *Am J Roentgenol* 138:1033–1036, 1982

A real-time device using a 5 MHz transducer was used to monitor the status of the renal collecting systems in children during the filling phase of cystourethrography. Microbubbles were pro-

duced by creating turbulence in the contrast material before its instillation in the bladder, and reflux was recognized by progressive dilatation of the collecting system and the presence of echogenic microbubbles within the pelvocalyceal system. In 15 positive cystograms with Grade II or greater reflux, sonography was positive in 87%. Grade I reflux is not recognized, and only the filling phase was monitored during the current study. Specificity was 100%. Very young or uncooperative children were particularly difficult to scan. The sonograms and correlating cystograms are presented.

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