ABSTRACTS OF CURRENT LITERATURE

Measurement of Complement Components in Cerebral Spinal Fluid by Radioimmunoassay in Patients with Multiple Sclerosis. P. Yam, L. D. Petz, W. W. Tourtellotte, B. I. Ma; City of Hope National Med. Ctr., Duarte, CA. *Clin Immunol Immunopathol* 17: 492–505, 1980

These authors used an existing radioallergosorbent test (RAST) to quantitate the third and fourth components of complement (C3 and C4) in cerebral spinal fluid (CSF). In 23 control subjects, normal ranges of C4 and C3 were 0.09–0.41 mg/dl (mean 0.26) and 0.46–1.10 mg/dl (mean 0.78), respectively. Of 33 patients having multiple sclerosis (MS), 32 had measured CSF C4 within the normal range. Twelve of the same patients, however, had CSF C3 above its normal range. In 20 normal subjects, CSF albumin was positively correlated with CSF C4, but there was no significant correlation between the other three possible combinations of protein (albumin, immunoglobulin G, and IgG) and complement component. In 126 patients having MS, CSF albumin was positively correlated with either CSF C3 or CSF/C4, whereas CSF IgG was not correlated with either complement component. Abnormalities in CSF C3 in MS patients appear to be due either to an altered blood-brain barrier or to increased CNS *de novo* synthesis of C3 in a manner analogous to that already documented for CSF IgG.

Immunoglobulins M and G to Varicella-Zoster Virus Measured by Solid-Phase Radioimmunoassay: Antibody Responses to Varicella and Herpes Zoster Infections. A. M. Arvin, C. M. Koropchak; Stanford Univ. School of Medicine, Stanford, CA. *J Clin Microbiol* 12:367–374, 1980

A radioimmunoassay (RIA) for quantitating immunoglobulin M (IgM) or IgG antibodies to varicella-zoster virus (VZV) in unfractionated serum is described. Higher VZV IgG antibody titers were measured in all subjects having acute herpes zoster tested either 2–14 days (eight patients) or 21–35 days (17 patients) after onset of disease than in all of 21 subjects who were not immune to varicella (latter group as determined by indirect immunofluorescence assay or in vitro lymphocyte transformation). Also, VZV IgG level was higher in all 42 subjects who had had primary varicella more than 20 yr earlier than in the 21 nonimmune subjects. All eight patients with acute varicella but only 18 of 26 patients with acute herpes zoster had VZV IgM antibody. Of the 15 people remote from viral infection but who had measurable VZV IgG antibody, none had detectable VZV IgM antibody. Antibodies to herpes simplex virus and cytomegalovirus found in several of the patients studied did not crossreact in the VZV antibody RIAs. IgG and IgM antibodies to VZV were present early in the course of primary varicella infection in normal subjects. Of eight patients tested within 4 days of onset of exanthem, seven subjects had IgG and six had IgM. Such titers continued to rise 7–16 days after the appearance of rash in most of the patients. These RIA procedures can detect susceptibility to varicella infection, which can be life threatening in immunocompromised children.

Hepatobiliary Scintigraphy with Tc-99m-PIPIDA in the Evaluation of Neonatal Jaundice. M. Majd, R. C. Reba, R. P. Altman; George Washington Univ., Children's Hosp., National Med. Ctr., Washington, DC. *Pediatrics* 67:140–145, 1981

These authors evaluated 22 patients (age 11 days–4 mo) having conjugated (mixed) hyperbilirubinemia. After i.v. injection of 1 mCi Iprofenin (Tc-PIPIDA) to patients fasted from <1–>2 hr before injection, anterior (and some lateral) images by gamma camera were made at 5-min intervals for the first hour and at 2, 4, 6, 8, and, in some instances, 24 hr after injection. Of the ten patients with biliary atresia confirmed later, no patient showed either gallbladder or bowel radioactivity. Six of those ten patients then received phenobarbital (PB) orally at dose of 2.5 mg/kg twice daily for 3–6 days before a repeated Tc-PIPIDA study. PB, known to enhance biliary excretion of rose bengal and conjugated bilirubin in patients with patent extrahepatic bile ducts, produced no change in imaging results from the initial study. In the ten patients with neonatal hepatitis confirmed later, only five showed tracer in gallbladder and bowel. Treatment of four of the remaining five with PB, however, led to bowel radioactivity (three patients) and gallbladder radioactivity (one patient) on the repeated Tc-PIPIDA study. The one patient having hepatitis and never showing bowel or gallbladder radioactivity even after administration of PB had the highest serum bilirubin (total and direct) of any patient included. PB treatment of two patients with jaundice, assumed secondary to prolonged hyperalimentation, elicited bowel (but not gallbladder) radioactivity, while the initial radiotracer studies (i.e., minus PB) showed no and equivocal bowel radioactivity, respectively. These authors feel it is "probably wise" to administer PB before the initial Tc-PIPIDA study since (a) PB dose is safe, (b) second administration of Tc-PIPIDA is avoided, and (c) differential diagnosis of jaundice is achieved without undue delay.

Intravenous Radionuclide Cystography for the Detection of Vesicorenal Reflux. J. E. Pollet, P. F. Sharp, A. I. Davidson, S. S. Miller; Univ. of Aberdeen, Aberdeen, Scotland. *J Urol* 125:75–78, 1981

Fifty-eight children had vesicorenal reflux documented by either radionuclide or radiographic cystography. The radionuclide study was performed by i.v. injection of 150–200 μCi/kg of body weight of Tc-99m DTPA and imaging sixty consecutive times for 20 sec each, using a gamma camera and computer storage. Following this renogram, 20 images of 5-sec duration were collected, and the patient was then asked to void while 40 more 5-sec images were collected. Time-activity curves were then generated from regions of interest over each kidney as well as over the bladder. A rise in activity over either kidney while bladder activity was falling constituted a positive test for reflux. Radiographic voiding cystograms were performed in a standard fashion while the patient was under general anesthesia. All patients were studied by both techniques as well as by cystocopy. Urine cultures were also obtained.

Fifty-three ureters with reflux were detected by radionuclide cystography, whereas only 32 were identified by radiographic voiding cystograms, and 15 by both studies. In the presence of an abnormal ureteral orifice or positive urine culture, significantly more ureters with reflux were identified by radionuclide cystography than by the radiographic study (50 as opposed to 26).

Radionuclide Imaging of Experimental Myocarditis. W. C. Reeves, G. L. Jackson, F. W. Flickinger, H. G. Kwee, E. J. Schwiter, J. Werner, L. Whitesell, M. A. Biddle, G. Copenhaver, B. S. Shaikh, R. Zelis; Penn State Univ. and Harrisburg Hosp., Hershey and Harrisburg, PA. *Circulation* 63:640–645, 1980

Two radiopharmaceuticals, gallium-67 citrate (Ga-67) and technetium-99m-labeled pyrophosphate (PPi) were evaluated in rabbits with experimentally produced myocarditis. Imaging was performed 70–74 hr after the induction of myocarditis by norepinephrine infusion, after which the animals were killed and the radioactivity in the excised heart was compared with that of thigh muscle from the same animal. Each animal received either 1.3 mCi Ga-67 or 5 mCi PPi, and a 10° LAO image was obtained 24 or 2–3 hr after injection, respectively. Gallium-67 gave positive images in 13 of 15 test animals, whereas five normal control animals showed no uptake. The hearts with positive images had mean radioactivity twice as great as that of thigh muscle, while the mean ratio in normal controls was 0.5. No PPi uptake was observed by imaging in the eight test rabbits subjected to this technique, and the ratio of activity in heart muscle to thigh muscle had a mean value of 1.0. Sections of hearts from the PPi test animals showed no evidence of tracer uptake in autoradiographs. All 23 hearts (from Ga-67 and PPi test animals) had histologic changes characteristic of myocarditis. Further investigation of Ga-67 imaging for the detection of myocarditis is warranted.

Radionuclide Ejection Fraction: A Technique for Quantitative Analysis of Motor Function of the Human Gallbladder. G. T. Krishnamurthy, V. R. Bobba, E. Kingston; VA Med Center and Univ. of Oregon, Portland, OR. *Gastroenterology* 80:482–491, 1980

The quantitative assessment of gallbladder motor function by calculation of the ejection fraction (EF) using Tc-99m-labeled N-α (2,6-dimethylacetanilido) iminodiacetic acid (HIDA) and i.v. cholecystokinin is sensitive, noninvasive, and easily reproducible. An in vitro GB model was used to establish the correlation of EF by volume and EF by counts ($r = 0.999$, $p < 0.001$). Six healthy, adult volunteers had measurement of their gallbladder EF on two occasions within a 2-wk interval to establish the reproducibility of the technique and EF calculation. Fasting subjects were positioned supine under a gamma camera, injected intravenously with 5–10 mCi Tc-HIDA, and serial images of the liver and GB were obtained at 2-min intervals for 60 min. Data were simultaneously acquired and stored using a computer. A saline infusion was given at 5 min; 40 ng/kg of octapeptide of cholecystokinin (OP-CCK) was infused intravenously at 10 min; and the gallbladder EF and minute-to-minute ejection rate were calculated. No evacuation of the gallbladder was observed after saline infusions. After Op-CCK infusion, four of six subjects showed gallbladder evacuation with a mean EF of 32% ± 14. Interobserver variation in the calculation of the EF was 5%; intraobserver variation was less than 2%. The EF obtained on a second occasion was almost identical to the first with a mean error of 5%. All six subjects showed gallbladder evacuation following fatty meal stimulation (mean EF 58%), indicating that the dose of OP-CCK was probably too high for optimum gallbladder contraction and that the correct dose of OP-CCK remains to be determined using this technique.

Radionuclide Regurgitant Index: Value and Limitations. N. Lam, D. Pavel, E. Byrom, A. Sheikh, D. Best, K. Rosen; Abraham Lincoln School of Med., Univ. College of Medicine, Chicago, IL. *Am J Cardiol* 47:292–298, 1981

Determination of a radionuclide regurgitant index (RRI) was carried out in 100 patients who had no evidence of mitral or aortic insufficiency (44 patients) or various grades of severity of regurgitation (56 patients) but no evidence of intracardiac shunt or tricuspid regurgitation. All patients underwent cardiac catheterization. The radionuclide study was done using in vivo Tc-99m-labeled RBCs and a large-field-of-view Anger camera equipped with a low-energy, all-purpose collimator and the data was computer stored and processed.

Regurgitation was graded 0 to 4^+ on the basis of angiographic findings. The RRI was obtained by dividing left ventricular stroke counts by right ventricular stroke counts. Patients without regurgitation had a RRI range of 0.9–2.9 with a mean of 1.34, a specificity of 94%, and a sensitivity of 73%.

There was a statistically significant difference in mean RRI between normal patients and those with each grade of regurgitation as well as between grades when separated by at least one grade (1 against 3 or 4) but not against 2.

In 12 patients, discordant RRIs were obtained, the prediction of their RRI being opposite to the angiographically established grade; it occurred in all three patients with prolapse of the mitral valve associated with frequent PVCs and in eight of ten patients with left ventricular ejection fractions of less than 30%.

Gated Cardiac Blood Pool Imaging and Thallium-201 Myocardial Scintigraphy for Detection of Remote Myocardial Infarction. A. J. Tiefenbrunn, D. R. Biello, E. M. Geltman, B. E. Sobel, B. A. Siegel, R. Roberts; Washington Univ. School of Med., St. Louis, MO. *Am J Cardiol* 47:1–5, 1981

The documentation of myocardial infarction at a time remote from the event has obvious clinical value. In this prospective study of 32 patients with myocardial infarction, which was graded for size on the basis of plasma MB creatinine kinase activity curves, patients were studied from 6–20 mo following the acute episode. The patients who had undergone cardiac catheterization studies because of recurrent chest pain and found to have normal electrocardiograms as well as patent (though stenosed in four cases) coronary arteries, served as controls.

Thallium-201 imaging and multigated ventriculography using in vivo labeled RBCs were performed in all patients using a standard technique, which is described. All studies were performed with the patient resting, and data was evaluated by two independent observers.

Focal defects were seen in the thallium-201 images 91–94% of the time in patients with previous myocardial infarction and in 0–20% of control patients. Differences in interpretation occurred in infarcted patients with creative kinase gram equivalent (CK-g-eq) values of 2.5–14.5 inclusive but not in patients whose CK-g-eq exceeded 14.5.

Regional wall motion abnormalities were detected by ventriculography in 75–78% of infarcted patients and in 0–10% of normal controls. Only 40–50% of infarcted patients with less than 20 CK-g-eq exhibited abnormal wall motion. All but one of the normal studies occurred in patients with subendocardial or inferior wall infarction. Left ventricular ejection fractions were significantly depressed in infarcted patients as compared with controls.

Persistent Q wave abnormalities were present in 68% of patients with greater than 20 CK-g-eq infarction size compared with 30% of patients with less than 20 CK-g-eq. Thus, thallium-201 imaging and ventriculography are more reliable in the detection of remote myocardial infarction than electrocardiography, and of these two modalities, thallium-201 imaging detected more remote myocardial infarctions in patients whose CK-g-eq was less than 20 than did ventriculography.

In addition, thallium-201 scintigraphy and ventriculography demonstrated concordance with previous Tc-99m pyrophosphate scintigraphy and electrocardiography in localization of the region of infarction.

In patients in whom the electrocardiogram showed an intraventricular conduction abnormality or was otherwise equivocal, gated ventriculography or thallium-201 myocardial imaging appear to be useful in documenting and localizing prior myocardial infarction.

A Computer-Based Scintigraphic Method for Sizing Acute Inferior Myocardial Infarcts. S. E. Lewis, L. M. Buja, R. W. Parkey, D. J. Mishelevich, F. J. Bonte, S. I. Saffer, J. R. Richmond, J. T. Willerson; Univ. of Texas Health Sciences Center, Dallas, TX. *Radiology* 136:439–442, 1980

Neither electrocardiographic nor two-dimensional scintigraphic images are effective for sizing inferior or posterior myocardial infarcts. Since infarct size has prognostic importance, geometric modeling techniques have been applied to images obtained using Tc-99m PYP in animals. A three-dimensional model of a volume may be obtained by projecting its outline as seen on multiple, two-dimensional images placed in proper relation to each other. The intersections of the multiple projections form an "envelope" enclosing the volume. Although scintigraphic images do not produce ideal outlines and the projected envelope will necessarily have a larger volume than the infarct, it is hoped that the infarct may occupy a fairly constant fraction of the envelope volume and thus permit a reasonable approximation of infarct size. Two standard sets of orthogonal projections pairs—anterior and left lateral, and RAO and LAO were used to develop three envelopes—two 2-view and one 4-view.

Acute inferior or inferoposterior myocardial infarcts were produced in 12 dogs that were imaged 24–48 hr later and sacrificed to allow morphologic infarct size determinations. The scintillation camera data were then computer processed to provide infarct volume estimates according to the model described. Comparisons between the model estimates and the measured infarct size are provided. Future work will attempt to refine the model and validate the assumption that the infarct occupies a constant fraction of the envelope, particularly with respect to type and location of infarct.

Observer Performance with Computer-Generated Image of ^{201}Tl-Cl Myocardial Perfusion. S. N. Wiener, M. J. Flynn, J. Edelstein; Mt. Sinai Hospital, Cleveland, OH. *Radiology* 136:181–185, 1980

The sensitivity and specificity of myocardial perfusion imaging with Tl-201 Cl are not sufficiently high to justify its use in patient populations that may be at risk but where symptoms are absent. This study reports on the effects of several types of image processing on the interpretation of Tl-201 Cl images with a view to improving lesion detectability.

Myocardial images were recorded, using standard techniques, from 33 unselected patients and stored in a computer in a 64 × 64 matrix. From each case, five sets of images were prepared for evaluation: (a) analog image from the camera CRT on Polaroid film; (b) 128 × 128 (interpolated) digital 16-level gray scale recorded on transparent film; (c) as (b), with 20% background subtraction; (d) 128 × 128 (interpolated) digital, 16-level, color scale, 20% background subtraction, recorded on color transparency film; (e) as (d), with nine-point weighted smoothing. All images were cropped to show only the myocardium.

Six experienced observers evaluated the images on a five-level scale, ranging from definitely normal to definitely abnormal, without benefit of other clinical findings. The total of 198 observer responses was then compared with the results of coronary angiography and the results expressed as receiver operating characteristics (ROC). ROC curves suggest that digital images are more reliable than analog, possibly because of the ability to express the gray scale over the count-rate range representing the myocardium and the contouring effect resulting from a gray scale limited to 16 levels. Background subtraction of 20% did not appear to improve accuracy. The best available presentation appeared to be the nonsmoothed color image, although the differences between the various digital formats may not be significant. The authors feel that their conclusion of the superiority of digitally produced images over analog Polaroid images is consistent with earlier studies.

Absorbed Fractions for Photons of ^{125}I and ^{127}I in the Thyroid. S. C. Erdman, E. R. Powsner, P. A. Plato. *Int J Appl Radiat Isot* 31: 421–423, 1980

The absorbed fraction for low-energy photons for a small object, such as the thyroid, is a very strong function of the model used in the calculation. The authors have used a model very similar to one previously used at Oak Ridge National Laboratories, but with some additional parameters incorporated to provide improved modeling of the gland. Monte Carlo calculations for 37 different thyroid masses for ten photon energies were performed. Uniform distribution was assumed. Regression equations are provided that permit accurate calculation of the absorbed fractions for thyroid masses between 18 and 40 g and photon energies between 27 and 40 keV.

Survey of ^{99m}Tc Contamination of Laboratory Personnel: Its Degree and Routes. H. Nishiyama, S. J. Lukes, P. A. Feller, R. J. Van Tuinen, C. C. Williams, E. L. Saenger; Nuclear Medicine Laboratory, Cincinnati, OH. *Radiology* 135:467–471, 1980

The extent and origin of internal contamination of personnel preparing Tc-99m-labeled radiopharmaceuticals was investigated by counting of urine samples and whole body scans. Activity was found in the urine of only those working the high-level laboratory except for early Monday morning samples. Estimates of the absorbed radiation dose for the individual showing the greatest activity were a yearly dose of 0.25 mrad (0.0025 mGy) to the whole body and 0.32 mrad (0.0032 mGy) to the bladder wall.

Repeated breathing over a jar containing Tc-99m resulted in no detectable internal contamination. Whole-body scans indicated face and hair contamination as well as contamination of the laboratory coat at the sleeves and waistline, suggesting that hand-to-mouth is the route of internal contamination.

Simple Leak Tests for Xenon-133 Charcoal Traps—Technical Note. I. B. Syed; V. A. Medical Center and Univ. of Louisville, Louisville, KY. *Health Phys* 39:306–308, 1980

The most convenient method of collecting exhaled xenon-133 after ventilation studies is by means of a charcoal trap. Xenon is readily diffusible, however, and may leak from the trap, prompting the Nuclear Regulatory Commission to require regular monitoring of the exit port. Commercial xenon-133 monitors for accomplishing this are available but expensive. The author describes two simple qualitative methods of testing for the fraction of xenon-133 that escapes from the trap.

In the first, a 25 l polyethylene bag is attached to the exit port. Following administration of a known activity of xenon-133 (dose vial measured before and after test), the spirometer system was washed out with 14 l of air that was collected in the bag. A second known activity was introduced into the spirometer and washed out directly into a second polyethylene bag without passing through the charcoal trap. The bag activities were then assayed in counts/min using a scintillation camera. The second method involves placing tablets of Reaqua's activated charcoal at the inlet and exhaust ports of the xenon trap. At the end of a ventilation

study the two tablets were assayed separately to provide a direct indication of escape fraction. From this the maximum permissible concentration (MPC) can be calculated if the air flow in the room containing the trap is known. A number of factors influence the accuracy of these techniques, but they may provide a useful indication of xenon trap performance in the absence of more sophisticated equipment.

Absolute Yield of 140.5 keV Gamma Ray Following Decay of ^{99}Mo. J. K. Dickens, T. A. Live. *Nucl Instr Meth* 175:535–541, 1980

The existing literature describing the decay of Mo-99 has rather large discrepancies among the reported experimental values for branching ratios in the decay of Mo-99—Tc-99. The discrepancies have not been resolved in two very recent review papers, despite the relative ease of obtaining the necessary high-precision data. The authors have determined the branching ratios for the Mo-99—Tc-99 decay using 3 GE photon detectors in conjunction with several calibration sources. The absolute intensity of the 140.5 keV gamma ray was determined to be 90.7 ± 0.6% per 100 Mo-99 disintegrations. A complete discussion of the method of analysis showing relationships among uncertainties of measured and evaluated data is given.

Application of a New Method to the Analysis of Radioactive Decays. T. Awaya. *Nucl Instr Meth* 174:237–242, 1980

The usual method of analyzing exponentially decaying data, such as that from radioactive sources, is to count data for preset intervals for several half-lives and apply the method of least squares to obtain the decay parameters. This procedure can be shown to lead to significant errors when the count rate is low. The author describes a new method for curve fitting such data that can be precisely applied to data that follow the Poisson distribution. Extensive computer testing has shown more accurate results with this method than with the method of least squares.

Neutron Cross-Sections and Kerma Values for Carbon, Nitrogen and Oxygen from 20 to 50 MeV. P. J. Dimbylow; National Radiological Protection Board, Harwell, England. *Phys Med Biol* 25: 637–649, 1980

Experimental data on neutron cross sections for the main constituents of tissue are scarce above 20 MeV. With the advent of high-energy neutron radiotherapy, however, this information is needed to determine the distribution of dose within the human body. The author describes an optical model for nuclear calculation and reaction kinetics used to convert the charged particle and recoil nucleus spectra into kerma. He presents the neutron cross sections and kerma factors and compares the latter with previous calculations using the intranuclear cascade plus the evaporation model. The underlying assumptions are discussed along with further areas of study.

Hydronephrosis in Children: Narrowing the Differential Diagnosis with Ultrasound. A. Chopra, R. L. Teele; Children's Hospital Med. Ctr. and Harvard Medical School, Boston, MA. *J Clin Ultrasound* 8:473–478, 1980

In the present study ultrasound was found to be a reliable method for differentiating obstruction at the ureteropelvic junction from either obstruction at the ureterovesical junction or vesicoureteral reflux. Serial transverse scans through the pelvis were used in the search for a dilated ureter. On transverse scans the dilated ureter appeared as a circular sonolucency posterior to the bladder and somewhat off the midline. On longitudinal scan a tubular sonolucence was identified. Identification of a dilated ureter places the level of obstruction below the ureteropelvic junction. The authors caution that the dilated renal pelvis may become so elongated as to dip into the bony pelvis and simulate a dilated ureter and that midureteral obstructions (though rare in children) may present difficulties. In those patients in whom hydroureter is identified, voiding cystourethrography is necessary to rule out the possibility of vesicoureteral reflux.

Diagnosis of Hydronephrosis: Comparison of Radionuclide Scanning and Sonography. S. R. Malave, H. L. Neiman, S. M. Spies, S. J. Cisternino, G. Adamo; Northwestern Univ. School of Medicine, Chicago, IL. *Am J Roentgenol* 135:1179–1185, 1980

The authors compared the accuracy of radionuclide scanning with gray-scale ultrasonography in the assessment of obstruction of the pelvicaliceal systems. Sonography was found to be the more accurate technique producing a sensitivity of 90%, specificity of 98%, and accuracy of 97%. The specificity of radionuclide studies was 89%, with 26% of the total series being indeterminate by virtue of renal failure. Radioisotope techniques provided information on renal blood flow and function not obtainable by sonography but was less effective in evaluating the kidneys for the presence or absence of obstruction. Fifty-six patients were studied over a 20-mo period.

Ultrasonic Features of Preeclampsia. B. Carroll; Stanford Univ. Med. Ctr., Stanford, CA. *J Clin Ultrasound* 8:483–488, 1980

In a group of 22 women with clinical preeclampsia a multiplicity of ultrasonographic parameters were measured, including total intrauterine volumes, placental volumes, placental maturation indexes, biparietal diameters, trunk diameters and circumferences, and head-to-abdominal circumference ratios established. Marked oligohydramnios was considered when less than 100 cc of amniotic fluid were present, mild to moderate was defined as 100—500 cc, and more than 500 cc of fluid was considered normal. Oligohydramnios was the most common ultrasonic feature associated with decreased total intrauterine volume and intrauterine growth retardation. Nearly 70% of the women with total intrauterine volume below the tenth percentile showed clinical evidence of intrauterine growth retardation. Abnormal head to abdominal ratios were seen in five of 12 cases of intrauterine growth retardation, indicating an asymmetric growth pattern. Accelerated placental maturation was identified. Ultrasonic features that appear to have prognostic value for the fetus were decreased total intrauterine volume and oligohydramnios. Representative sonograms are provided.

Fetal Cranial and Craniocervical Masses: Ultrasound Characteristics and Differential Diagnosis. R. E. Sabbagha, R. K. Tamura, S. Dal Compo, S. Elias, C. Salvino, A. Shkolnik, A. B. Gerbie; Northwestern Univ. Med. School, Chicago, IL. *Am J Obstet Gynecol* 138:511–517, 1980

Detailed studies of ten pregnant women at high risk for fetal anomalies yielded anatomically recognizable defects in the skull or spinal canal indicating neural tube anomalies in two cases. In the remaining eight fetuses the cranial and craniocervical masses

were not associated with a demonstrable skull or spine defect. The absence of a definable defect, therefore, by no means rules out the diagnosis of neural tube anomalies. Meningoceles, cystic hygromas, encephaloceles and other conditions are described and illustrated. The covering over a meningocele has a relatively thin wall, as opposed to the thick wall produced by fetal edema. This characteristic is useful in differentiating between the two entities. The authors caution that a gestational sac from a blighted twin may simulate a meningocele if properly apposed to the fetal skull. The lack of motion of this structure with motion of the fetus is a useful differential point. Sonograms and gross specimen photographs are provided.

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