

20. Hirleman, M. T., Yiu-Chiu, V. S., Chiu, L. L., et al.: The resectability of primary lung carcinoma: A diagnostic staging review. *CT*, 4:146-163, 1980.
21. Homer, M. J., Wechsler, R. J., and Carter, B. L.: Mediastinal lipomatosis: CT confirmation of a normal variant. *Radiology*, 128:657-661, 1978.
22. Johnson, D. H., Windham, W. W., Allen, J. H., et al.: Limited value of CT brain scans in the staging of small cell lung cancer. *A.J.R.*, 140:37-40, 1983.
23. Lillingston, G. A.: The utility of needle aspiration biopsy of the lung. *Mayo Clin. Proc.*, 55:516-517, 1980.
24. Livesay, J. S., Mink, J. H., Fee, H. J., et al.: The use of computed tomography to evaluate suspected mediastinal tumors. *Ann. Thorac. Surg.*, 27:305-311, 1978.
25. Mendelson, D. S., Rose, J. S., Efremidis, S. C., et al.: Bronchogenic cysts with high CT numbers. *A.J.R.*, 140:463-465, 1983.
26. Muhm, J. R., Brown, L. R., and Crowe, J. K.: Detection of pulmonary nodules by computed tomography. *A.J.R.*, 128:267-270, 1977.
27. Muhm, J. R., Brown, L. R., and Crowe, J. K.: Use of computed tomography in the detection of pulmonary nodules. *Mayo Clin. Proc.*, 52:345-348, 1977.
28. Muhm, J. R., Brown, L. R., Crowe, J. K., et al.: Comparison of whole lung tomography and computed tomography for detecting pulmonary nodules. *A.J.R.*, 131:981-984, 1978.
29. O'Keefe, M. E., Jr., Good, C. A., and McDonald, J. R.: Calcification in solitary pulmonary nodules of the lung. *A.J.R.*, 77:1023-1033, 1957.
30. Osborne, D. R., Korobkin, M., Ravin, C. E., et al.: Comparison of plain radiography, conventional tomography and computed tomography in detecting intrathoracic lymph node metastasis from lung carcinoma. *Radiology*, 142:157-161, 1982.
31. Pugatch, R. D., Faling, L. J., Robbins, A. H., et al.: CT diagnosis of benign mediastinal abnormalities. *A.J.R.*, 134:685-694, 1980.
32. Rigler, L. G., and Heitzman, E. R.: Planigraphy in the differential diagnosis of the pulmonary nodule: With particular reference to the notch sign of malignancy. *Radiology*, 65:692-702, 1955.
33. Sandler, M. A., Peralberg, J. L., Madrazo, B. L., et al.: Computed tomographic evaluation of the adrenal gland in the preoperative assessment of bronchogenic carcinoma. *Radiology*, 145:733-736, 1982.
34. Schaner, E. G., Chang, A. E., Doppman, J. L., et al.: Comparison of computed and conventional whole lung tomography in detecting pulmonary nodules: A prospective radiologic-pathologic study. *A.J.R.*, 131:51-54, 1978.
35. Schnyder, P. A., Gamsu, G.: CT of the pretracheal retrocaval space. *A.J.R.*, 136:303-308, 1981.
36. Siegelman, S. S., Zerhouni, E. A., Leo, F. P., et al.: CT of the solitary pulmonary nodule. *A.J.R.*, 135:1-13, 1980.
37. Sones, P. J., Torres, W. E., Colvin, R. S., et al.: Effectiveness of CT in evaluating intrathoracic masses. *A.J.R.*, 139:469-475, 1982.
38. Todd, T. R. J., Weisbrod, G., Tao, L. C., et al.: Aspiration needle biopsy of thoracic lesions. *Ann. Thorac. Surg.*, 32:154-161, 1981.
39. Underwood, G. H., and Newell, J. D.: Computerized axial tomography in the diagnosis of intrathoracic disease. In Fishman, A. P. (ed.): *Update: Pulmonary Diseases and Disorders*. New York, McGraw Hill Book Co., 1982.
40. Underwood, G. H., Jr., Hooper, R. G., Axelbaum, S. P., et al.: Computed tomographic scanning of the thorax in the staging of bronchogenic carcinoma. *N. Engl. J. Med.*, 300:777-778, 1979.
41. Westcott, J. L.: Percutaneous needle aspiration of hilar and mediastinal masses. *Radiology*, 141:323-329, 1981.
42. Zerhouni, E. A., Boukadoum, M., Siddiky, M. A., et al.: A standard phantom for quantitative analysis of pulmonary nodules. *Radiology*, 149:767-773, 1983.

Department of Radiology  
University of Arizona Health Sciences Center  
Tucson, Arizona 85724

## Imaging of the Breast

James D. Richardson, M.D.,\* Olcay S. Cigtay, M.D.,†  
Edward G. Grant, M.D.,‡ and Paul C. Wang, Ph.D.§

It is currently estimated that breast cancer will develop in one out of every 11 women in America.<sup>5, 40</sup> Not only does carcinoma of the breast have the highest incidence of all cancers in women in the United States, but it also carries the highest mortality.<sup>5</sup> The ultimate prognosis for this disease, regardless of the mode of therapy employed, depends primarily on the extent of the disease at the time of diagnosis. The survival data for locally advanced and disseminated disease are discouraging; however, when the disease is localized to the breast, the 5-year survival is approximately 85 per cent.<sup>1, 5</sup> Five-year survival rates of 93 per cent have been recorded for women with clinically occult (nonpalpable) cancers found by mammographic screening.<sup>16</sup> It therefore becomes imperative to diagnose the disease when the lesion is small, ideally prior to clinical presentation.

Screening for breast cancer has been conclusively shown to be beneficial in a controlled screening program initiated in the early 1960s by the Health Insurance Plan (HIP) of New York. Using physical examination and early film mammography, a one-third reduction in mortality was achieved in the screened group relative to controls.<sup>5, 16, 40, 47</sup> While the indications for screening an asymptomatic population with mammography are still being defined, there is no doubt that mammography and other breast imaging modalities have a role to play in the evaluation of the symptomatic patient. The distinction between the evaluation of an asymptomatic patient in a screening program and the evaluation of a woman who presents to her physician with signs or symptoms of breast disease deserves emphasis. The indications for the use of the various imaging modalities for the breast

From the Department of Radiology, Georgetown University Hospital, Washington, D.C.

\*Assistant Professor of Radiology

†Associate Professor of Radiology, Director of Mammography

‡Associate Professor of Radiology, Director of Ultrasound

§Radiologic Physicist