2, resemble those reported in these studies. Bonow et al. found a reduced peak filling rate in 72% of CAD patients with normal ejection fraction and wall motion, in 76% of those with normal ejection fraction, and in 85% of all patients. Polak et al. reported a depressed peak filling rate in 52% of patients with coronary disease without myocardial infarction, and in 85% of those with prior myocardial infarction. Our findings generally agree with both studies but more closely approximate the results of Polak et al. Reduto et al. analyzed the first-third filling fraction but did not report individual peak filling rates.

Comparing the regional and global analyses in the present study, six patients were correctly identified as abnormal only by the regional method while two were abnormal based only on results of global analysis. This slightly greater overall sensitivity of the regional analysis in both disease groups (65% vs. 50% and 75% vs. 69%, Figs. 2 and 3 and Table 3), tends to support the view that regional abnormalities are a more sensitive indicator of ischemic disease than is global dysfunction, although the difference is not statistically significant and further study in a larger group of patients is required to substantiate this impression.

In summary, the results reported here indicate that regional as well as global left-ventricular diastolic behavior can be characterized quantitatively by noninvasive analysis of diastolic cardiac function, providing a sensitive, practical means for early detection of ischemic heart disease.

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REFERENCES

- SWIRYN S, PAVEL D, BYROM E, et al: Sequential regional phase mapping of radionuclide gated biventriculograms in patients with left bundle branc block. Am Heart J 102: 1000-1010, 1981
- LINKS JM, DOUGLAS KH, WAGNER HN: Patterns of ventricular emptying by Fourier analysis of gated blood-pool studies. J Nucl Med 21:978-988, 1980
- 3. YIANNIKAS J, UNDERWOOD D, MACINTYRE WJ, et al:

- Pre and postoperative analysis of left ventricular aneurysms by Fourier phase and amplitude analysis of radionuclide scans. J Nucl Med 23:P55, 1982 (abst)
- HANRATH P, MATHEY DG, SIEGERT R, et al: Left ventricular relaxation and filling pattern in different forms of left ventricular hypertrophy: An echocardiographic study. Am J Cardiol 45:15-23, 1980
- SUTTON MGSTJ, TAJIK AJ, GIBSON DG, et al: Echocardiographic assessment of left ventricular filling and septal and posterior wall dynamics in idiopathic hypertrophic subaortic stenosis. Circulation 57:512-520, 1978
- MANN T, MCLAURIN L, BRODIE BR, et al: Effect of ischemia on left ventricular isovolumic relaxation in man. Clin Res 25:236A, 1977 (abst)
- MILLER TR, SAMPATHKUMARAN KS: Digital filtering in nuclear medicine. J Nucl Med 23:66-72, 1982
- MILLER TR, GOLDMAN KJ, SAMPATHKUMARAN KS: Characterization of the temporal properties of the gated cardiac blood pool study. In Nuclear Medicine and Biology, Proceedings of the Third World Congress of Nuclear Medicine and Biology. Paris, 1982, Paris, Pergamon Press, 1982, pp 1831-1834
- MILLER TR, SAMPATHKUMARAN KS: Design and application of finite impulse response digital filters. Eur J Nucl Med 7:22-27, 1982
- BRIGHAM EO: The fast fourier transform. Englewood Cliffs, NJ, Prentice Hall, Inc., 1977, pp 75-109
- BIELLO DR, SAMPATHKUMARAN KS, GELTMAN EM, et al: Determination of left ventricular ejection fraction: A new method that requires minimal operator training. J Nucl Med Tech 9:77-80, 1981
- WONNACOTT TH, WONNACOTT RJ: Introductory statistics. 3rd Edition. New York, John Wiley and Sons, 1977, P17
- ARMITAGE P: Statistical methods in medical research. London, Blackwell Scientific Publications, 1977, pp 1312–134, 396-407
- HAMMING RW: Digital filters. Englewood Cliffs, NJ, Prentice-Hall, Inc., 1977, pp 15-26
- LUDBROOK PA, BYRNE JD, TIEFENBRUNN AJ: Association of asynchronous protodiastolic segmental wall motion with impaired left ventricular relaxation. Circulation 64: 1201-1211, 1981
- BONOW RO, BACHARACH SL, GREEN MV, et al: Impaired left ventricular diastolic filling in patients with coronary artery disease: Assessment with radionuclide angiography. Circulation 64:3151-323, 1981
- POLAK JF, KEMPER AJ, BIANCO JA, et al: Resting early peak diastolic filling rate: A sensitive index of myocardial dysfunction in patients with coronary artery disease. J Nucl Med 23:471-478, 1982
- REDUTO LA, WICKEMEYER WJ, YOUNG JB, et al: Left ventricular diastolic performance at rest and during exercise in patients with coronary artery disease. Circulation 63: 1228-1237, 1981

ERRATUM

The footnote to the title of the 1982 Author Index (page 1155) and Subject Index (page 1161) should read:

P preceding a page number indicates an abstract of the Annual Meeting, appearing in the May 1982 issue.