Title

End-diastolic mask subtraction: An improved method for displaying wall motion abnormalities using a digital angiography computer system

Journal

The American Journal of Cardiology, 49(4)

ISSN

0002-9149

Authors

Johnston, Warren D
Tobis, Jonathan
Nalcioglu, Orhan
et al.

Publication Date

1982-03-01

DOI

10.1016/0002-9149(82)92149-x

The American Journal of CARDIOLOGY Volume 49 935
March 1982

END-DIASTOLIC MASK SUBTRACTION: AN IMPROVED METHOD FOR DISPLAYING WALL MOTION ABNORMALITIES USING A DIGITAL ANGIOGRAPHY COMPUTER SYSTEM

Warren D. Johnston, MD; Jonathan Tobis, MD, FACC; Orhan Nalcioglu, PhD; J. Anthony Seibert, PhD; Werner W. Roeck; Lloyd T. Iseri, MD, FACC; Uri Elkayam, MD; Walter L. Henry, MD, University of Calfornia, Irvine, Orange, CA

Assessment of wall motion abnormalities may be time consuming because it is often necessary to trace the outline of end-diastolic and end-systolic ventriculographic images in order to adequately evaluate wall motion. To simplify this procedure, we used a prototype digital angiography computer system to obtain an image which summarizes and displays wall motion on one frame. Previously recorded digital intravenous angiograms were redigitized by the computer. The iodine-filled end-diastolic image of the left ventricle was used as a mask and subtracted from each ensuing frame until end-systole. The resultant subtracted image at end-systole (or at any time during ventricular contraction or relaxation) displayed a white shell which represented the difference between the ventricular images at end-diastole and end-systole. This shell image allowed direct visualization of ventricular wall motion and quantitation of end-diastolic, end-systolic and stroke volumes. In 8 patients (pts) with wall motion abnormalities on standard cine ventriculograms, akinetic segments were depicted as "holes" in the shell while dyskinetic segments were seen as black instead of white changes in the shell. In 7 pts without wall motion abnormalities, a complete white shell was seen. Thus, end-diastolic mask subtraction with digital angiography is a clinically promising method for summarizing wall motion abnormalities on a single frame from which end-diastolic, end-systolic and stroke volumes can be computed.