USEFULNESS OF REGIONAL DIASTOLIC PHASE
INDEX BY GATED CARDIAC BLOOD POOL IMAGING
IN PATIENTS WITH CORONARY ARTERY DISEASE.
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In order to investigate the usefulness of regional diastolic phase index of the left
ventricle (LV) in patients with coronary artery disease (CAD), multigated card-
diac blood pool imaging were performed at rest at LAO position. Ten normal subjects
and 20 patients with CAD with normal ejection fraction (EF) (85%) were studied.
LV was divided into 8 segments from the geometric center and regional volume curves were
obtained in each of them, and in 5 except for cardiac base following parameters were
obtained: 1) uniformity of regional beginning of ejection (REJ) 2) ununiformity of
development of regional endystole (RES) 3) regional EF 4) regional filling rate during the first half
of rapid filling phase (FR-in-1/2RF). CAD were divided into 2 groups according to the absense (Gr.I) or presence (Gr.II) of previous
history of myocardial infarction. Ununiformity of REJ was not different among
3 groups. Ununiformity of RES was significantly (p<0.01) greater in Gr.II than that in Normal, but it was not different between
Gr.I and Normal. Abnormalities in RES were observed in 20% of Gr.I and 60% of Gr.II.
On the contrary, abnormalities in regional
FR-in-1/2RF were observed in 80% of Gr.I and 100% of Gr.II. Besides abnormalities in regional
FR-in-1/2RF made possible the
detection of stenosed coronary artery.

ESTIMATION OF SYSTOLIC AND DIASTORIC
FUNCTIONS IN HYPERTROPHIC AND ISCHEMIC HEART
DISEASES USING FOURIER ANALYSIS. S. Kodama,
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Fourier analysis of gated blood-pool images using higher order harmonics was
performed in 79cases to evaluate global and
regional cardiac function. Following indexes were obtained: EF(Ejection fraction), PER(Peak
eflection rate), TPE(time to PER), TES(time to
dysystole), PFR(Peak filling rate), TPF(time to
PER), PER/TPF, TPF/TPE, TPS(PSD), TPE(PSD), and
TPF(PSD). Patients with ischemic heart
disease (IHD) showed significantly lower
PFR, longer TPE, and lower tendency of PER
than normal group. Patients with hyper-
trophic heart disease (HCM:Hypertrophic
cardiomyopathy, HOCM:Hypertrophic obstruc-
tive cardiomyopathy, HHD:Hypertensive
heart disease) showed significantly longer
TPF, higher PER than normal group. Patients
with IHD, HCM and HOCM showed significantly
higher TPF(PSD) than normal group, suggesting
asynchronous relaxation. However, patients
with HHD showed normal TPF(PSD).

We conclude that Fourier analysis of
gated blood-pool images using higher order
harmonics provides useful informations of
systolic and diastolic properties in
ischemic and hypertrophic heart diseases.

EVALUATION OF A NEWLY DEVELOPED CARDIAC REAL
TIME MONITORING SYSTEM FOR MULTI-GATED
RADIONUCLEIDE ANGIOGRAPHY. Y. Nakamura, H. Omi-
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Y. Tsunouka, T. Fukushima*, M. Matsumoto*,
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We developed a new radionucleide angio-
graphic procedure(cardiac real time monitor:
CRTM) in order to evaluate serial changes in
cardiac function during exercise. BY CRTM,
multi-gated images were produced from a mini-
um of sampling number of 20 cardiac cycles and
then hemodynamic parameters such as eje-
tion fraction(EF), end-diastolic and end-
systolic counts and heart rate were obtained.
To investigate the reliability of LV EF ob-
tained with this new procedure, radionucleide
angiography was performed in 11 cases and
LVF was repeatedly calculated from sampling number of 20, 40 and 60 in 600 cardiac cycles. Maximum variance in LVF(maximum LVF minus
minimum LVF in each case) for sampling num-
ber of 20, 40 and 60 cardiac cycles were
14.1±3%, 7.8±3% and 6.0±2%, respectively. As
sampling number of cardiac cycles collected
were small, LVF tended to be higher than
than that calculated from sampling number of 600
cardiac cycles. These were not different among
different number of 60 cardiac cycles may not
be sufficient to get reliable LVF probably
due to statistical fluctuation caused by low
counts. Conversely synchronized to R-wave
increasing count density will be required in
order to apply this new procedure to clinical
study.

DEVELOPMENT OF A NEW ACQUISITION TECHNIQUE
FOR MULTI GATED IMAGES CONVERSELY SYNCHRO-
IZED TO R-WAVE APPLYING THE MULTI BUFFER
METHOD. K. Kume, H. Wani, Y. Koga and
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and Yokohama.

It is necessary to acquire multi gated
time images for accurate in phase pre-
ceding R-wave, for example diastolic phase
or isovolumetric contraction phase.
Usually, for getting multi gated images
cently synchronized to R-wave, it is
necessary to acquire data in list mode and
to convert to images consuming much processing
time.
In the case of arrhythmia, this
method compels us to use memory unefficiently
because of the useless data acquisition.
A new technique has been developed that
ables us to acquire the multi gated images
conversely synchronized to R-wave in image
mode at the time of normal multi gated image
acquisition simultaneously neglecting the
irregular pulses.
SCINTIPAC-70A" and its high speed image
operation unit are used for data processing
system and image operation respectively.
The details of this technique and some
clinical data will be reported.