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CLINICAL EVALUATION OF LEFT VENTRICULAR EJECTION FRACTION BY FIRST PASS AND MULTI-
GATED RADIONUCLIDE CARDBANGIOGRAPHY. T. Nishimura, Y. Inami, Y. Kaga wa, M. Hay ash i, T. Kozuka
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The left ventricular ejection fraction (LVEF) can be measured quantitatively from
radionuclide angiography using an Anger camera and on-line minicomputer system.
LVEF by first pass method was calculated by the average of three cardiac cycles which
responded to the left ventricular volume changes during each cardiac cycles, on the
other hand, LVEF by multi-gated method was calculated the ratio or SV/EDV counts de-
termined from the left ventricular volume curves. The effects of LV size and back-
ground on determination of LVEF were exa-
mined on both methods. The findings demonstrated that the time activity curve must be
generated from ROI fits LV precisely and must be corrected from the contribution
arising from non cardiac structure.

First pass EF was correlated well with con-
tact EF in 20 patients (r=0.89) and multi-
gated EF was correlated well with contrast
EF in 50 patients (r=0.90). Then, First pass EF and multi-gated EF has simple cor-
relation coefficients of 0.87.

In conclusion, these noninvasive methods appear particularly useful for serial
evaluation of cardiac patients.

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COMPARISON OF VENTRICULAR FUNCTION BETWEEN THE FIRST PASS METHOD AND THE EQUILIBRIUM
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sity School of Medicine. Tokyo and Yokohama.

Left ventricular ejection fraction (LVE-
F) and ventricular wall motion obtained by
the first pass method were compared with
those by the equilibrium method.

Materials and Methods: Thirty cases (11 normal volunteers, 13 myocardial infarctio-

ns and 6 others) were examined. Used unit
was Pho/Gamma V (Searle) with parallel hole
collimator and Pho/Gamma LBFV (Searle) with
bilateral collimator was partly employed.

In the first pass method, all cases were ob-
served from RAO and a few cases were observed
from LAO at the same time. The equilibrium
method was performed from LAO in all cases.

Results: LVEF obtained by the first pass
method from RAO had good relations with LV-
EF obtained by the equilibrium method (y=
1.02x-3.86, r=0.92). In the first pass
method, LVEF from LAO was less than LVEF
from RAO, probably due to the overlap of
the aorta. About the ventricular wall mot-
ion, first pass method from RAO could detec-
t the asynergy of anterior wall, inferior wall
and a part of posterior wall. Equili-

brium method was suitable to observe later-
al wall and septum.

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EVALUATION OF LEFT VENTRICULAR FUNCTION AT
CARDIAC PACING BY MULTI-GATED RADIONUCLIDE
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In recent years, with the development and
use of programmable pacemakers, there has
been a growing need for a method to measure
the hemodynamic effects of changes in pacer
parameters. The parameters calculated from
multi-gated and dye methods were cardiau
output, end-diastolic volume, end-systolic volume,
stroke volume and ejection fraction. The re-
lation SV counts determined from edge extrac-
tion of ED, ES images were good correlation
with stroke volume by dye method.

4 patients of complete A-V block treated
with programmable pacemaker were studied
at various heart rates (30-120/min) by these
methods. According to the increase of heart
rate, rate-output curve showed the flat type.
EDV, ESV, SV were decreased gradually and
EF was unvariable in all cases.

In conclusion, left ventricular function at ventricular pacing by increase of heart
rate were mainly determined from the decre-
ase of EDV caused by the shortening of fill-
ing time of left ventricle, therefore, oth-
er parameters were changed by the contract-
ility of myocardium and Starling's law of
cardiac function.

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ARTIFACT BY RESPIRATORY MOTION ON ASSESSMENT
OF LEFT VENTRICULAR FUNCTION USING EQUILIBRIUM
CARDIAC BLOOD POOL SCINTIGRAPHY. H. Wakamatsu,
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cine. Muroran, Etemu and Sapporo.

A conjugate gated method (COG) which yields
both respiratory and ECG synchronized images
(RESIM) and a respiratory synchronized (RES
) region of interest technique (RESROI ) which
assessed left ventricular curve (LVC ) in con-
sideration of respiratory motion (REM ) has been
developed using a minicomputer system and an
expiratory trigger trial device. Measurements
were made at rest, immediately after supine
bicycle exercise and 10 minutes after it utili-
zation LAO view with a gamma camera following in vivo Tc-99m(15-20 mCi) blood pool labelling.
RESIM were reconstructed by COG as both RT gate (200 msec) and ECG gate (30 msec) were closed. These images might have showed that only ECG
synchronized images were blured by REMO, and
so more after exercise. RESROI was performed by variable ROI adjusted to changes in RES
position of LV images throughout the RR cycle. By
thin, it might have been proved in normal person
that under no consideration of REMO LVC was
distorted, and LVEF(%) was assessed more lower as follows:

at rest after EX 10min after EX

heart rate 75 120 75
use RESROI LVEF 70 85 71
no RESROI LVEF 75 76

These methods may be useful and necessary for
cardiac performance study.