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QUANTITATIVE EVALUATION OF DIAGNOSTIC EFFI-
CACY FOR MEDICAL IMAGE INTERPRE TATION.
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cal Sciences.Anagawa,Chiba-shi.

Quality of the health care should be main-
tained in high standard and thus be measur-
ed quantitatively and periodically. The
quality of health care may be evaluated by
its efficacy and efficiency. Expert commi-
ttee on efficacy of World Health Organizat-
ion has defined four levels of medical
efficacy which start from diagnostic effi-
cacy to population health efficacy. In this
presentation,the diagnostic efficacy of
medical image interpretation is defined and
example of its measurement is presented.
Diagnostic efficacy of the image is quant-
itatively measured by rate of correct
diagnosis which are classified into sensi-
tivity (true positive rate) and specificity
(true negative rate). Measurements of
sensitivity and specifieity are not easy,
since they needs large amount of confirmed
cases as a gold standard. We have completed
a retrospective study of diagnostic efficacy
for liver image and Tl-201 myocardial image
interpretation. The methodology of the
study was described in detail with a special
emphasis on the operating characteristic
(ROC) andlysis.

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EFFICACY OF THE IMAGING
THE THYROID IMAGING
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In our study I used Hg-197 chloride, Tl-201
chloride and Ga-67 citrate in thyroid scintigraphy
and compared these agents. These joints use of
thyroid scintigraphy resulted in a qualitative
diagnosis of thyroid tumor.

Summary :
1) I concluded that Tl-201 chloride has no specific
affinity for malignant thyroid tumors and can not be
used to discriminate between carcinoma and adenoma,
but that surgery should be indicated for nodules which
show positive figures by Tl-201 chloride scintigraphy.
2) I could get the histological diagnosis of thyroid
tumor using thyroid scintigraphy with these radio-
isotopes.
The results are as shown in this table.

	$^{197}HgCl_2$	^{201}Tl-chloride	^{67}Ga-citrate
Thyroid Cancer			
differentiated carcinoma	+	+	−
anaplastic carcinoma	+	−	+
medullary carcinoma	+	+	−
Malignant Lymphoma	+	+	+
Adenoma			
colloid adenoma	±	−	−
tubular adenoma	±	+	−
trabecular adenoma	±	+	−
Graves's disease	−	+	−

+ : Uptake, − : No Uptake

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AN EVALUATION OF DIAGNOSTIC EFFICACY OF
CARDIOVASCULAR NUCLEAR MEDICINE FOR DETE-
CTION OF MYOCARDIAL INFARCTION. H. Murata
and H. Tabuchi. Tokyo Metropolitan Geria-
tric Hospital, Tokyo.

The purpose of the present study was to
evaluate the diagnostic efficacy of the
images obtained by nuclear cardiology for
detection of the lesions in the patients
with myocardial infarction. In the present
study two types of studies were performed.
The first study was a clinical one in which
direct left ventriculogram(LVG) & coronary
arteriogram(CAG) was employed as a gold
standard. The other was a study with auto-
psy cases.

1. Clinical study.
Thirty cases with transmural infarction
proved the infarcted lesions by LVG & CAG,
and 4 cases without abnormal finding on LVG
& CAG were studied. The images evaluated in
the present study were regional wall motion
display obtained by ECG gated radionuclide
cardiography(gate method), functional color
image by phase analysis, and planar image
of Thallium(Tl) myocardial scan. Tl scan
was judged by visual interpretation and
circumferential profile analysis. The ima-
ge by each modality was independently ana-
lyzed by two observers without the informa-
tion of LVG & CAG. The results represented
the consensus of these two observers. For
evaluation of efficacy of regional wall mo-
tion display by gate method, regional wall
motion of each segment from 1 to 7 was

comparea with that of LVG. In 238 segments
of 34 cases, sensitivity, specificity and
accuracy for regional wall motion abnorma-
lity were 74, 94 and 86%, respectively. The
functional image of phase analysis was also
compared with LVG. Five regions such as
anterior, lateral, septal, inferior and po-
sterior region were analyzed in each case.
In 170 regions of 34 cases, sensitivity,
specificity and accuracy were 67, 89 and
79%, respectively. On comparison of Tl scan
of 170 region in 34 cases, sensivity, spe-
cificity and accuracy of visual interpreta-
tion were 67, 86 and 77%. On the other hand,
sensitivity, specificity and accuracy of
circumferential analysis were 45, 86 and 68
%, and the sensitivity of this method was
considerably lower than that of visual
interpretation.

2. Autopsy study.
Tl scan findings of 6 cases with transmural
infarction, 4 cases with nontransmural
infarction and 10 cases without infarction
were compared with autopsy findings. Five
regions of anterior, lateral, septal, infe-
rior and posterior portion were analyzed in
each case. Overall sensitivity, specificity
and accuracy for detection of of infarcted
lesion were 61, 98 and 88%, respectively.
In 30 regions only in 6 cases with trans-
mural infarction, however, sensitivity, spe-
sificity and accuracy were 94, 92 and 93%,
whereas none was detected in 11 infarcted
lesions of 4 cases with nontransmural infa-
rction.