

^{99m}Tc-MIBI

:

1

2

3

Technetium-99m methoxyisobutylisonitrile(^{99m}Tc-MIBI)

: 1997 1 1998 10 64 , ^{99m}Tc-MIBI

: 64 33 가 31 가 86.2%, 64.5%, 가 87.9%, 76.7%, ^{99m}Tc-MIBI 78.8%, 74.2%

. ^{99m}Tc-MIBI 가

(biopsy)

3

가

50

30%

(1, 2).

가

가

가

가 10-30%

70-90%가

가

가 가

가

50

가

가 (3-7).

Technetium-99m

methoxyisobutylisonitrile(MIBI)

(8). (Fat necrosis), (Hemato- ma), (Fibrosis), (Abscess) (Scarring)

^{99m}Tc-MIBI

가

(9, 10).

1997 1 1998 10

가

가 61

25

87

44.4

¹가
²가
³가

1999 6 16

1999 11 9

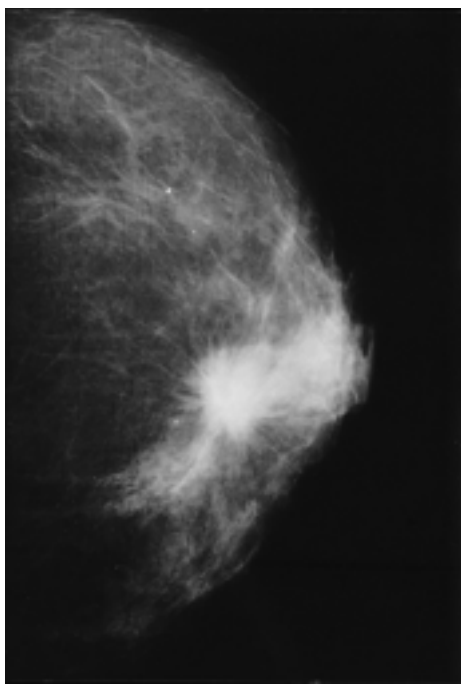
^{99m}Tc-MIBI

56

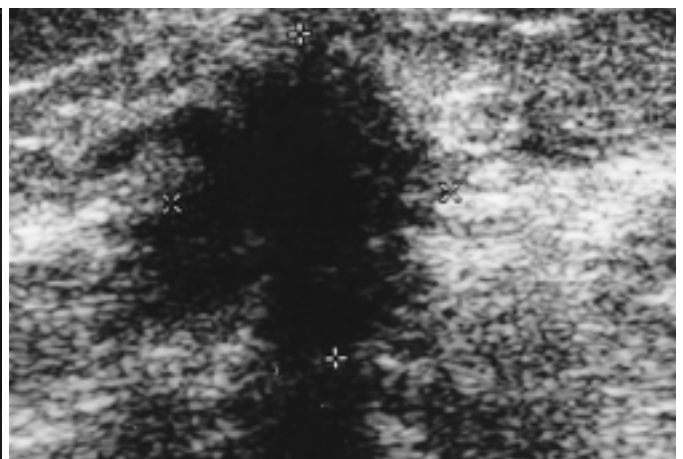
, 60

MAM-
MOMAT C3 (Simens, Erlangen, Germany)
(mediolateral oblique view) (craniocaudal)
1
HDI -3000
(ATL , Bothell, Washington, USA) 5-10 MHz
1
 ^{99m}Tc -MIBI 20- 30mci ^{99m}Tc -
MIBI 가
, 5-10 Dual Detector system
(SPECT)
가
1995
9 American college of Radiology가 Breast Imaging
Reporting And Data System(BI-RADS™), Second edition.
5 (Category 1 - Negative, 2

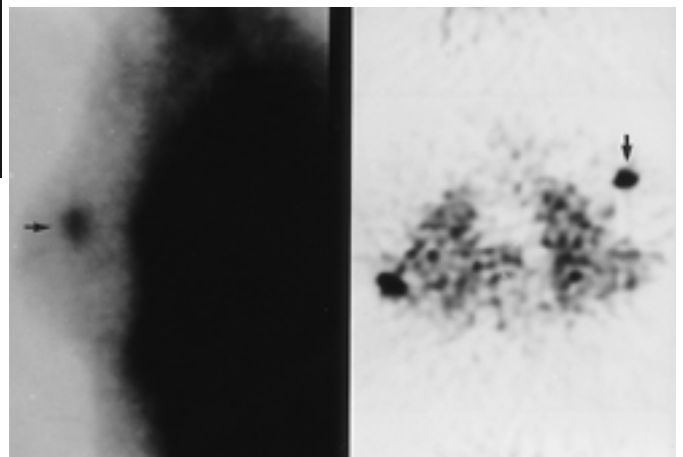
^{99m}Tc -MIBI
:
- Benign Finding, 3 - Probably Benign Finding, 4 - Suspicious
Abnormality, 5 - Highly Suggestive of Malignancy). 1 3
, 4 5
1989 11
, , , , ,
, / 7가
,
5 .(0 - 1 : Definitely benign, 2
- 5 : Suggestive benign, 6 : Equivocal, 7 - 10 : Suggestive
malignant but cannot be rule out benign, 11 : definitely
malignant)(11). 1 3 , 4
5 ^{99m}Tc -MIBI
가
(planar) (SPECT)
,
 ^{99m}Tc -MIBI
 ^{99m}Tc -MIBI (ratio)
(semiquantitative in-



A



B



C

Fig. 1. Invasive ductal carcinoma involving the upper inner quadrant of the left breast in a 46-year-old woman.
A. Craniocaudal mammogram shows an irregular-shaped dense mass which has radiating spicules with surrounding parenchymal distortion and infiltrations. This mass is highly suggestive of malignancy(Category 5).
B. On ultrasonography, an irregular-margined and ill-defined hypoechoic mass with posterior shadowing is noted and consider as definitely malignant(Group 5).
C. Planar lateral(left) and transverse(right) SPECT ^{99m}Tc -MIBI Scintimammogram shows focal areas of increased uptake in the left breast that correspond to the mammographic and sonographic abnormality(arrow). The arithmetic mean of the semiquantitative indices was 3.87, suggesting malignancy.

dices)

(Receiver operating characteristic curve)

(1.98) 1.98 , 1.98

(Fig. 1, 2).

61 64 가 . 21

(excisional biopsy) 33

(US (guided automated gun biopsy)

7

. 3

가

33

33

(Invasive ductal carcinoma) 26 ,

(Mucinous carcinoma) 2 ,

(Malignant phyllodes tumor) 2 , (Intraductal carcinoma)

(Tubular carcinoma) 1 ,

(Intraductal papilloma)

1 ,

(Invasive lobular carcinoma)

가 1 . 3

가 1cm , 20

가 1-3cm

10 가 3cm

28

31

가

3

가

(Fibroadenoma) 13 ,

(Fibrocystic disease) 6 ,

가 5 ,

가 2 ,

2 ,

(Adenosis) 1 ,

(Proteinaceous material)

가 1 ,

(Ductal and acinar proliferative lesion)

1

23

가 1-3cm

6

가 3cm

. 2

56

59

가

29

가

, 30

가

. 3

가

36

4

4

가

, 11

(Table

, 2

1).

4

가

가

가

4

가

3

가

(circumscribed mass)

1

, 1

5

4

, 3

^{99m}Tc-MIBI

2

, 5

4

2

가

^{99m}Tc-MIBI

2

87.9%, 76.7%

80.6%, 85.2%,

23.3%, 12.1%, 82.5%

Table 1. Statistical Results of Mammography, Ultrasonography and ^{99m}Tc-MIBI Scintimammography in the Diagnosis of Breast Lesions

	MM	US	MIBI
TP	25(42.4%)	29(46%)	26(40.7%)
FN	4(6.8%)	4(6.4%)	7(10.9%)
FP	11(18.6%)	7(11.1%)	8(12.5%)
TN	19(32.2%)	23(36.5%)	23(35.9%)
Total	59	63	64

TP: True positive, FN: False negative,

FP: False positive, TN: True negative

MM: Mammography, US: Ultrasonography,

MIBI: ^{99m}Tc-MIBI scintimammography

^{99m}Tc-MIBI

11

1

, 2

5

, 2

, 1

가

4

1

^{99m}Tc-MIBI

4 가

1

, 1

2

86.2%

64.5%

69.4%, 83.3%,

35.5%, 13.8%, 75%

1

60

63

가

33

가

, 30

가

3

가

36

, 27

(Table 1).

가

4

1

^{99m}Tc-MIBI

3

7

가

1

, 1

5

4

, 3

^{99m}Tc-MIBI

2

				^{99m} Tc-MIBI																																			
				Table 2																																			
				87.9%, 76.7%																																			
				82.5%																																			
				80.6%,																																			
				85.2%																																			
				Table 2. Comparison Between Mammographic, Ultrasono- graphic and Scintigraphic Results in Breast Lesions																																			
				<table><tr><td></td><td>MM</td><td>US</td><td>MIBI</td></tr><tr><td>Sensitivity (%)</td><td>86.2</td><td>87.9</td><td>78.8</td></tr><tr><td>Specificity (%)</td><td>64.5</td><td>76.7</td><td>74.2</td></tr><tr><td>PPV (%)</td><td>69.4</td><td>80.6</td><td>76.5</td></tr><tr><td>NPV (%)</td><td>83.3</td><td>85.2</td><td>76.7</td></tr><tr><td>FPR (%)</td><td>35.5</td><td>23.3</td><td>25.8</td></tr><tr><td>FNR (%)</td><td>13.8</td><td>12.1</td><td>21.2</td></tr><tr><td>Accuracy (%)</td><td>75.0</td><td>82.5</td><td>76.6</td></tr></table>					MM	US	MIBI	Sensitivity (%)	86.2	87.9	78.8	Specificity (%)	64.5	76.7	74.2	PPV (%)	69.4	80.6	76.5	NPV (%)	83.3	85.2	76.7	FPR (%)	35.5	23.3	25.8	FNR (%)	13.8	12.1	21.2	Accuracy (%)	75.0	82.5	76.6
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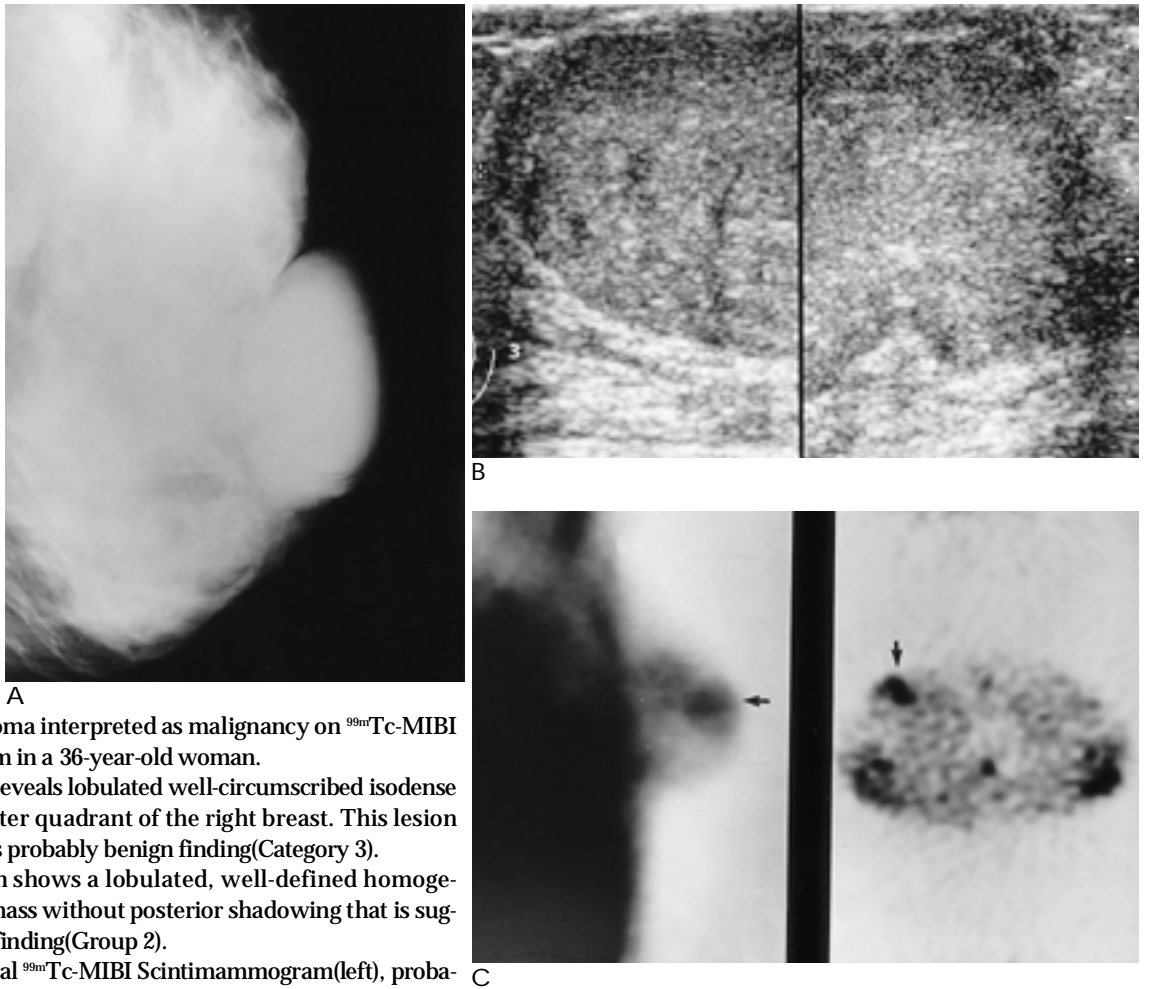


Fig. 2. Fibroadenoma interpreted as malignancy on ^{99m}Tc-MIBI Scintimammogram in a 36-year-old woman.

A. Mammogram reveals lobulated well-circumscribed isodense mass in upper outer quadrant of the right breast. This lesion was interpreted as probably benign finding(Category 3).

B. Ultrasonogram shows a lobulated, well-defined homogeneous isoechoic mass without posterior shadowing that is suggestive of benign finding(Group 2).

C. On planar lateral ^{99m}Tc-MIBI Scintimammogram(left), probably malignant diffuse tracer uptake was noted in the right breast(arrow). Transverse SPECT scan(right) also shows increased tracer uptake in right breast(arrow). The arithmetic mean of the semiquantitative indices was 2.64, suggesting malignancy.

[illegible]

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Comparison between Mammography, Ultrasonography and ^{99m}Tc -MIBI Scintimammography in the Diagnosis of Breast Cancer¹

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Purpose: To compare the feasibility of ^{99m}Tc -MIBI scintimammography as a tumor localizing agent in breast lesions in comparison with that of mammography and ultrasonography, and to evaluate the efficacy of these three modalities.

Materials and Methods: Sixty-four breast lesions were classified as benign or malignant on the basis of sonographic and mammographic criteria and were further analyzed by means of ^{99m}Tc -MIBI scintimammography. The classifications thus obtained were compared with the biopsy findings, and in order to compare the three techniques, the sensitivity, specificity, accuracy, and negative and positive predictive values were calculated for each individual modality.

Results: Of 64 histologically proven lesions, 33 were malignant and 31 were benign. Sensitivities and specificities for malignancy were 86.2 % and 64.5 % for mammography, 87.9 % and 76.7 % for sonography, and 78.8 % and 74.2 % for ^{99m}Tc -MIBI scintimammography.

Conclusion: Mammography and ultrasonography are reliable diagnostic modalities for the detection of breast cancer. ^{99m}Tc -MIBI scintimammography has a higher specificity than mammography and it may help to reduce unnecessary biopsies.

Index words : Breast, neoplasm
Breast, radiography
Breast, radionuclide studies
Breast, US

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