Technetium-99m-sestamibi scintimammography of benign and malignant phyllodes tumors

Hitoya Ohta,* Tomoo Komibuchi,* Toshihiro Nishio,** Toshiyuki Kita,** Shunji Yamamoto,** Minoru Ukiusa,** Hiroji Awane,** Kunikatsu Irie*** and Masayuki Shintaku***

Departments of *Laboratories, **Surgery and ***Pathology, Osaka Red Cross Hospital

We presented two cases of phyllodes tumor of the breast examined by $^{99m}$Tc-sestamibi (MIBI) two-phase scintimammography. In the case with malignant phyllodes tumor, $^{99m}$Tc-MIBI accumulation was recognized on both early and delayed images. In the case with benign phyllodes tumor, however, $^{99m}$Tc-MIBI accumulation was recognized on only the early image. $^{99m}$Tc-MIBI delayed imaging may have the potential to distinguish between benign and malignant phyllodes tumors.

Key words: technetium-99m-sestamibi, scintimammography, phyllodes tumor

INTRODUCTION

Phyllodes tumor accounts for less than 1% of breast tumors and have been divided into benign, borderline and malignant groups. It is not easy to distinguish between benign and malignant phyllodes tumors by mammography and sonography, since there is substantial overlap in the imaging characteristic. Recently high diagnostic accuracy of $^{99m}$Tc-sestamibi (MIBI) scintimammography in detecting breast cancer has been reported. We report two cases of phyllodes tumor examined by $^{99m}$Tc-MIBI scintimammography and discuss the potential to distinguish between benign and malignant phyllodes tumors.

CASE REPORT

Scintimammography was performed at 15 minutes (early image) and at 3 hours (delayed image) after intravenous injection of 600 MBq of $^{99m}$Tc-MIBI. The anterior planar view including both breasts and axillary regions in the supine position was obtained with a Toshiba GCA 7200-A gamma camera equipped with a low-energy, high resolution parallel hole collimator.

Case 1  A 51-year-old female was admitted because of a rapidly enlarging breast tumor. She had noticed a firm lump in the right breast three years before her admission. Scintimammography was performed and $^{99m}$Tc-MIBI accumulation was recognized on both early and delayed images (Fig. 1 A, B). Simple mastectomy was performed. The tumor measured 20 cm $\times$ 17 cm $\times$ 13 cm and histopathology revealed malignant phyllodes tumor (Fig. 2 A, B).

Case 2  A 29-year-old female was admitted because of an enlarging left breast tumor. She had noticed the tumor nine months before. Scintimammography was performed and $^{99m}$Tc-MIBI accumulation was recognized on an early image (Fig. 3A), but was not recognized on a delayed image (Fig. 3B). The tumor was excised widely. The tumor measured 8 cm $\times$ 6.5 cm $\times$ 5 cm and histopathology revealed benign phyllodes tumor (Fig. 4 A, B).

DISCUSSION

Because of diverse criteria of histopathologic analysis, the percentage of malignant subgroup varies from 23% to 50% of all phyllodes tumors. Preoperative diagnosis is difficult, since with mammography and sonography there is substantial overlap in the imaging characteristics of benign and malignant phyllodes tumors. Recently developed $^{99m}$Tc-MIBI scintimammography offers new hope in breast imaging. To our knowledge, there is no literature on $^{99m}$Tc-MIBI scintimammography of phyllodes tumor. Our case showed that $^{99m}$Tc-MIBI...
**Fig. 1** (Case 1) $^{99m}$Tc-MIBI accumulation in the lesion was recognized on both early and delayed images (A: early, B: delayed).

**Fig. 2** (Case 1) Surgery revealed malignant phyllodes tumor (A: Gross appearance of the tumor, B: H & E stain).

**Fig. 3** (Case 2) $^{99m}$Tc-MIBI accumulation was recognized on early image (A), but $^{99m}$Tc-MIBI accumulation was cleared on delayed image (B).
delayed imaging may have the potential to distinguish between benign and malignant phyllodes tumors. Concerning the uptake mechanism, it has been reported that 99mTc-MIBI accumulates within mitochondria on the basis of electrical potentials generated across the membranes. And since malignant tumors maintain a more negative transmembrane potential, 99mTc-MIBI accumulation increases, 7,8 but 99mTc-MIBI accumulation also relates with tumor vascularity or high cellularity.10,11 We considered that the 99mTc-MIBI accumulation on the early image in case 2 was due to a reflection of blood flow or the high cellularity of the tumor. It has recently been found that the presence of multidrug resistance-mediated P glycoprotein excludes 99mTc-MIBI accumulation.8,9 Unfortunately we could not examine the expression of P glycoprotein in case 2.

In conclusion, 99mTc-MIBI scintimammography was performed in two cases of phyllodes tumor. In the malignant case, 99mTc-MIBI accumulation was recognized on both early and delayed images. In the benign case, 99mTc-MIBI accumulation was recognized only on the early image. Further experience is necessary to confirm the possibility to distinguish between benign and malignant phyllodes tumor with 99mTc-MIBI scintimammography.

ACKNOWLEDGMENTS

The authors thank Mr. Masumi Inoue, Mr. Koji Yoshii and Mr. Kazunori Ayabe for their valuable assistance.

REFERENCES


Vol. 11, No. 1, 1997

Case Report 39