Mammographic and Clinicopathological Features of Mucinous Carcinoma of the Breast

Minoru Matsuda*, Masataka Yoshimoto*, Takuji Iwase*, Kaoru Takahashi*, Fujio Kasumi*, Futoshi Akiyama* and Goi Sakamoto*

Background: We attempted to improve the effectiveness of diagnostic techniques in mammographic imaging of mucinous carcinoma of the breast by defining the characteristics of mammographic images and investigating correlations between these images and various clinicopathological findings.

Methods: Clinicopathological investigations of 92 lesions in 90 cases of mucinous carcinoma of the breast were made. Mammography demonstrated 80 lesions with identical tumor shadow characteristics and these were divided into three patterns, circumscribed, indistinct and blended. Correlations between clinicopathological findings and mammographic images were investigated.

Results: Patients with mucinous carcinoma of the breast usually present with a palpable mass. The lymph node metastasis rate in this study was low and prognosis in the early postoperative period was satisfactory. On mammograms, the circumscribed pattern was the most frequent. The investigation of the correlation between histological subtype and mammographic pattern showed a high percentage of pure type lesions exhibited in the circumscribed pattern while those of mixed histologic type often showed the indistinct pattern. Calcification frequency demonstrated on mammography was 75% for the indistinct and mixed patterns, and approximately 50% for the circumscribed pattern. A high rate of calcification seen outside the tumor shadow suggested a high frequency of invasion and the spread of cancer to neighboring tissues. The circumscribed pattern was least frequently associated with lymph node metastasis, followed by the indistinct and blended patterns in that order.

Conclusion: Investigation of clinicopathological factors and mammographic findings in mucinous carcinoma of the breast suggests that mammography provides clinically valuable information for the treatment of this disease. These findings indicate the importance of careful mammographic observation at the time of diagnosis.


Key words: Mucinous carcinoma of the breast, Mammographic images, Clinicopathological findings

Mammography is an essential diagnostic tool for breast masses. In mucinous carcinoma of the breast, mammography displays characteristic forms but reports on this subject are few and the details are unclear. Investigation of 92 lesions from 90 surgical cases in patients with a histological diagnosis of mucinous carcinoma was performed by correlating clinicopathological factors with characteristic mammographic findings. The purpose of this study was to investigate the clinicopathological features of mucinous carcinoma as well as the characteristic mammographic findings, and to investigate the correlation between these parameters to ascertain the utility of mammographic findings. The tumor shadows consistently demonstrated on mammography of mucinous carcinoma were categorized into three patterns, circumscribed, indistinct and blended. Each pattern was investigated for correlation with clinicopathological findings, and for the presence, form and distribution of mammographic calcifications.

Materials and Methods

A total of 3056 patients with primary breast cancer underwent surgery from January 1988 to December 1993 at the Department of Breast Surgery at the Cancer Institute Hospital. Ninety-two
lesions from 90 cases histologically diagnosed as mucinous carcinoma were investigated. As four lesions had undergone biopsy at other hospitals, an investigation of mammographic findings was made in 88 lesions from 87 cases. Mammographic images were taken from at least two projections and the image displaying the most distinct form was chosen as the tumor image. Eighty cases showed tumor shadows considered to be characteristic. Evaluation of calcification was made with the aid of a magnifying glass, and those considered to be benign on the basis of location and form were excluded, while those suggestive of malignant calcification were studied. The interpretation of the tumor image, margin, shape and density complies with the ACR BI-RADS standardized lexicon. With this interpretation, along with our own, the tumor images were classified into three patterns (Fig 1). In the circumscribed pattern, the shape is round, oval or lobular, the margin shows a largely distinct mass which is circumscribed or microlobulated and occasionally accompanied by a halo and notching, and is suggestive at first glance, of a cyst or fibroadenoma. In the indistinct pattern, the shape is irregular, the margin shows a mostly indistinct mass with a stellate density accompanied by spiculation at times, and vague high density shadows are seen. In the blended pattern, the margin is distinct in some parts and indistinct in others, and shadows that are a mixture of the circumscribed and indistinct patterns are seen. Each of the three patterns was studied for frequency, correlation with tumor size (T), stage, histological sub-type (pure and mixed), presence of histological lymph node metastasis and calcification. The clinicopathological factors of mucinous carcinoma were studied for frequency, chief complaint, age, menopausal status, duration of complaint, tumor size (T), stage, surgical procedure, histological sub-type, histological lymph node metastasis, hormone receptor (estrogen receptor [ER], progesterone receptor [PgR]), and prognosis. Significant differences were determined using the \( \chi^2 \) test. All abbreviations used comply with those listed in the “General Rules for Clinical and Pathological Recording of Breast Cancer.”

### Results

#### Clinicopathological Factors

**Frequency:** Of a total of 3056 cases of breast cancer, 90 (2.9%) were mucinous carcinoma and two were bilateral mucinous carcinoma.

**Complaint:** A palpable mass was seen in 86 cases (93.5%), and this was the most frequent complaint. Abnormal nipple discharge was seen in two cases (2.2%). One case (1.1%) was detected on physical examination. One case (1.1%) was detected by axillary lymph node swelling.