PAPILLARY CARCINOMA OF THE BREAST: CYTOLOGIC/HISTOLOGIC CORRELATION AND CLINICAL IMPLICATION

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Abstract

Introduction  Papillary carcinoma (CA) of the breast is a rare lesion, whereas papilloma accounts for approximately 10% of benign breast lesions. Distinction between low-grade papillary CA and other benign lesions can be difficult. The aim of our study was to assess the usefulness of cytological diagnosis for papillary lesions of the breast.

Methods  Cases were obtained from Maharaj Nakorn Chiang Mai Hospital from 2000 to 2004. All breast lesions diagnosed by biopsy as papilloma or papillary CA, intraductal (DCIS) or invasive, were identified. Those with accompanying cytology examination were used for this study.

Results  There were 52 breast lesions diagnosed by histology including 39 cases of papilloma, 6 DCIS papillary CA, and 7 invasive papillary CA. Twenty-nine of these cases had a preceding cytological examination. Cytology results were available for 19/39 cases diagnosed as papilloma. The cytological diagnoses included papillary lesion(8). Of the 6 cases diagnosed as DCIS papillary CA, 4 had cytology specimens diagnosed as papillary lesion(1). Of the 7 cases diagnosed as invasive papillary CA, 6 had cytology specimens diagnosed as papillary lesion(2). Overall, 11/29(38%) cases that showed some form of papillary lesion on biopsy were identified as papillary on cytology.

Conclusion  In our series, a definite diagnosis of malignant papillary lesions was difficult on aspiration cytology alone. However, cytology was helpful in approximately 40% of cases in identifying papillary lesions, and such cases are recommended to proceed to biopsy. Chiang Mai Medical Journal 2007;46(4):141-146.

Keywords: breast, papillary, cytology, fine needle aspiration
Papillary neoplasms of the breast include a broad spectrum of mammary lesions, ranging from benign to malignant. In some cases, it is difficult to distinguish between benign and malignant lesions by either cytologic or histologic appearance. In addition, cytological features of papillary lesions may overlap with other benign and malignant breast lesions, including fibroadenoma, phyllodes tumor, as well as ductal carcinoma. Nevertheless, preoperative diagnosis of papillary lesions is useful for proper surgical management. The purpose of this study was to assess the usefulness of a cytological diagnosis for papillary lesions of the breast.

**Methods**

Of all breast specimens, histologically diagnosed at Maharaj Nakorn Chiang Mai Hospital (Chiang Mai, Thailand) from 2000 to 2004 as papilloma, DCIS papillary CA, and invasive papillary CA, only those with accompanying cytology examination were included in this study. The available histologic and FNA slides were reviewed. The cytological diagnoses given for the papillary lesions were papilloma, papilloma with atypia, papillary lesion, papillary lesion with atypia, and suspicious of papillary or ductal CA. The term “papilloma” was used in cases where their cytological findings fulfilled the criteria of benign papilloma. “Papillary lesion” was used when the cytological findings could not distinguish between benign and malignant papillary lesions. The histologic diagnoses correlated with the preceding FNA cytological diagnoses.

**Results**

From a total of 52 cases, 39 (75%) were histologically diagnosed as papillomas, 6 (11.5%) as DCIS papillary CA, and 7 (13.5%) as invasive papillary CA. The patients’ age ranged from 20 to 65 years for papillomas, 48 to 71 years for DCIS papillary CA and 24 to 78 years for invasive papillary CA. All patients were female. Twenty-nine of these cases had a preceding cytological examination. Cytology results were available for 19/39 cases diagnosed as papilloma. The cytological diagnoses included fibrocystic change (1), fibroadenoma (1), benign epithelial proliferations (5), papillary lesion (6), papilloma (2), suspicious of CA (2), suspicious of phyllodes tumor (1) and unsatisfactory result (1). Of the 6 cases diagnosed as DCIS papillary CA, 4 had cytology specimens diagnosed as suspicious of papillary CA (1), suspicious of phyllodes tumor (1) and unsatisfactory result (2). Of the 7 cases diagnosed as invasive papillary CA, 6 had cytology specimens diagnosed as fibrocystic change (1), papillary lesion (2), suspicious of CA (1), suspicious of phyllodes tumor (1) and unsatisfactory result (1). Overall, 11/29 (38%) cases that showed some form of papillary lesion on biopsy were identified as papillary on cytology. Interestingly, the diagnoses of phyllodes tumor, as well as suspicious of ductal carcinoma, were given from cytologic specimens in the histologic diagnoses of both of papilloma and papillary CA.

Individual cases with histologic and cytologic correlation are shown in Figure 1-2. The cytology and histology of benign papilloma are illustrated in Figure 1, while a papillary carcinoma without cytologic atypia is shown in Figure 2.

**Discussion**

Papillary neoplasms of the breast include a wide spectrum of mammary lesions, ranging from benign to malignant. In some cases, it is difficult to distinguish between benign and malignant lesions by either cytologic or histologic appearance. In addition, cytological features of papillary lesions may overlap with other benign and malignant breast lesions, including fibroadenoma, phyllodes tumor, as well as ductal carcinoma.
Figure 1. Papilloma A) Clusters and papillary fragments of benign-looking epithelial cells with few bipolar naked nuclei are shown (x100). The inset (upper right) shows some naked nuclei and foamy histiocytes (x400) B) The corresponding histology shows a papilloma, revealing of papillary fronds with fibrovascular cores (x40).

Figure 2. Papillary carcinoma A) Papillary fragments compose of benign-looking columnar cells (x400). The inset (upper right) shows papillary fragments with some foamy histiocytes in the background (x200) B) The corresponding histology shows multiple cystic spaces with papillary fronds, lined by malignant columnar cells.
from benign to malignant. Papillary CA of the breast is rare, whereas papilloma accounts for approximately 10% of benign breast lesions. Although radiological findings are helpful in suggesting papillary lesions, distinguishing between benign and malignant lesions cannot be conclusive. Therefore, any breast lesions suggested by radiologic study as papillary lesions should be excised. The cytologic study plays an important role in 1) breast lesions suggested by radiologic study as papillary lesions that confirm the diagnosis and provide more specific diagnosis as to whether they are benign or malignant, and 2) breast lesions with out available radiologic study, which have cytological features of papillary lesions that provide, more specific diagnosis as to whether they are benign or malignant. This information should be provided, if possible, for proper management.

The cytologic criteria for benign papillomas include cellular smear with benign ductal cells in clusters and papillary fragments, as well as scattered naked nuclei, single columnar cells and apocrine metaplastic cells. Cytologic specimens of papillary CAs usually reveal highly cellular smears with papillary structures of epithelial cells, numerous single columnar cells, cellular atypia and a lack of bipolar naked nuclei. Large and complex sheets of ductal epithelial cells were observed in some cases of papillary CA. However, papillary CA may show only mild to moderate cellular atypia or none at all. On the contrary, infarct papillomas may have marked cellular atypia with necrotic background. Hemorrhagic background, necrotic cells and foamy histiocytes can be found in both papilloma and papillary carcinoma. Therefore, in some cases, it is difficult to distinguish between benign and malignant lesions by cytological findings. In our study, 2 out of 6 papillary CA cases revealed cytological features of papillary lesion without cellular atypia. However, it is important to detect papillary lesions of the breast using the mentioned criteria, since all cases of papillary lesions should be excised for definite histologic diagnosis as benign or malignant. In addition, distinction between low-grade papillary CA and papilloma, as well as fibroadenoma and phyllodes tumor can be difficult. Our study demonstrated the same experience for a small number of cases of both papillomas and papillary carcinomas, which had cytological features suggestive of ductal carcinoma or phyllodes tumor. Furthermore, cystic CAs other than papillary CA include ductal carcinoma with cystic degeneration, medullary CA, squamous cell or metaplastic carcinoma as well as cystic hypersecretory CA. For those CAs, a cytologic study can be useful for ascertaining a specific cell type. Since the proper protocol of treatment for those cell types is different, it would be useful to provide pre-operative diagnosis by a non-invasive procedure, particularly fine needle aspiration cytology. In comparison between fine needle aspiration cytology and a core biopsy study of papillary lesions, one study suggested that both diagnostic tools share similar diagnostic challenges and a follow-up surgical excision is indicated.

In conclusion, our study demonstrated that a cytologic study may not be able to distinguish between true papillary and nonpapillary proliferative lesions and a definite diagnosis of a malignant papillary lesion was difficult on aspiration cytology alone. However, cytology was helpful in identifying papillary lesions in approximately 40% of cases and such cases are recommended to proceed to biopsy.
References
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บทคัดย่อ
วัตถุประสงค์ มะเร็งเต้านมชนิดพาพิลารีพบได้ไม่บ่อย ในขณะที่เนื้องอกชนิดพาพิโลมาพบได้ประมาณร้อยละ 10 ของโรคร้ายในเต้านม แต่เนื่องจากมะเร็งชนิดพาพิลารีมีลักษณะทางเซลล์วิทยาที่เป็นทางศักราชทางคลินิก
วิธีการ ศึกษาจากผู้ป่วยที่มีการรักษาในโรงพยาบาลมหาวิทยาลัยเชียงใหม่ ระหว่าง พ.ศ. 2543-2547 ทั้งหมดเป็นผู้ป่วยที่ได้รับการวินิจฉัยจากชิ้นเนื้อ และมีการตรวจทางเซลล์วิทยาตามที่มีการส่งตรวจทางเซลล์วิทยาอยู่
ผลการศึกษา มีผู้ป่วยทั้งหมด 52 รายที่ได้รับการวินิจฉัยจากชิ้นเนื้อ แยกเป็น 39 ราย ไม่ลุกลาม, 6 ราย มีอาการพาพิโลมา, และ 7 ราย มะเร็งเต้านมชนิดพาพิลารี แบ่งเป็น 6 ราย มะเร็งเต้านมชนิดพาพิลารีและ 1 ราย ไม่ลุกลาม ตามที่มีการส่งตรวจทางฮิสโตโลยี 50 ราย มีการส่งตรวจทางเซลล์วิทยา 63 ราย แยกเป็น 39 ราย ไม่ลุกลาม, 26 ราย มีอาการพาพิโลมา และ 5 ราย มะเร็งเต้านมชนิดพาพิลารี, รวมทั้งหมด 28 ราย แบ่งเป็น 26 ราย ไม่ลุกลาม และ 2 ราย มีอาการพาพิโลมา

สรุป จากการศึกษาพบว่าการวินิจฉัยมะเร็งเต้านมชนิดพาพิลารีโดยวิธีทางฮิสโตโลยีมีประโยชน์ในการแยกประเภทมะเร็งแบบพาพิลารีได้ประมาณร้อยละ 40 และสามารถส่งตรวจทางเซลล์วิทยาเพื่อใช้ประโยชน์ได้

คำสำคัญ: เท้านม, มะเร็ง, วิทยาการเจาะดูดด้วยเข็มเล็ก