Case Report

Lactational adenoma: A diagnostic pitfall on fine needle aspiration cytology

Wu Bingcheng, Yeo Yen Ching[1], Tay Zhi En Amos[2], Yan Zhiyan[3], Mihir Gudi[1]

Department of Pathology, National University Hospital, [1]Department of Pathology and Laboratory Medicine, [3]Breast Department, KK Women's and Children's Hospital, [2]Department of Anatomical Pathology, Singapore General Hospital, Singapore

Abstract

Pregnancy induces hormone-related breast changes which pose diagnostic challenges in the evaluation of a breast lump. In particular, fine needle aspiration cytology of a lactating adenoma may mimic malignancy. The authors present a case of a woman with a right breast lump. Fine needle aspiration cytology demonstrated the presence of numerous single-occurring epithelial cells with large round nuclei, discrete nucleoli, and ample vacuolated cytoplasm. Taken in isolation, this finding would be suspicious for malignancy. However, the clinical history of recent pregnancy was duly noted as was the presence of a granular vacuolated background on cytology. An accompanying core biopsy confirmed the lesion to be a lactating adenoma. This case highlights lactating adenoma as a potential diagnostic pitfall on fine needle aspiration cytology.

Keywords: Adenocarcinoma, diagnostic pitfall, fine needle aspiration cytology, lactating adenoma

Address for correspondence: Dr. Mihir Gudi, Department of Pathology and Laboratory Medicine, KK Women's and Children's Hospital, 100 Bukit Timah Road, Singapore 229899, Singapore.
E-mail: gudi.mihir.a@kkh.com.sg

INTRODUCTION

Lactating adenomas of the breast typically present during periods of pregnancy and lactation as palpable, well-circumscribed, lobulated masses which may wax and wane in size. While the sudden appearance of a breast lump may be alarming to the patient, lactating adenomas have no malignant potential, and they often regress spontaneously. Nonetheless, a thorough workup would involve the triple assessment, comprising clinical, radiological, and pathological evaluation. As part of the pathological evaluation, solid areas may be subjected to tissue core biopsy, and cystic areas may aspirate for fluid cytology. The surgical pathologist needs to be familiar with the epithelial changes of the breast terminal duct lobular unit (TDLU) that may occur during pregnancy and lactation, so as to avoid erroneously interpreting benign lactational changes as malignant on small biopsy or cytology samples.

CASE REPORT

A 35-year-old Chinese woman, 1-month postpartum, presented with a nonenlarging right breast lump of 6 months' duration. She had been breastfeeding uneventfully for the past 1 month, was not on any long-term medications, and had no other significant past medical history. The patient's paternal grandmother had a history of breast cancer, which was diagnosed in her 40s.

Clinical examination revealed a well-circumscribed, soft, and mobile mass measuring approximately 2.5 cm in size on the right breast at the 6–7 o'clock position. On

Access this article online	
Quick Response Code:	Website: www.ijcpc.org
	DOI: 10.4103/ijcpc.ijcpc_16_17

How to cite this article: Bingcheng W, Ching YY, En Amos TZ, Zhiyan Y, Gudi M. Lactational adenoma: A diagnostic pitfall on fine needle aspiration cytology. Int J Clinicopathol Correl 2017;1:47-9.

bedside ultrasonography, the lesion was noted to have solid and cystic components. A subsequent more detailed ultrasonography scan revealed the lesion to be a lobulated heterogeneous solid-cystic nodule, which measured 3.3 cm × 2.0 cm in size, with ill-defined borders in some areas [Figure 1]. The cystic component was aspirated for fluid cytology, and the remaining solid component was biopsied for histological evaluation.

Fluid cytology [Figure 2] demonstrates numerous scattered cyst macrophages as well as a granular foamy background consisting of cell cytoplasm fragments and lipid. While overall cellularity is low, there are single-occurring and loosely cohesive clusters of ductal epithelial cells with ample vacuolated cytoplasm, enlarged hyperchromatic eccentric angulated nuclei, visible nucleoli, and coarsely clumped chromatin. Occasional bare nuclei are present in the background. No stromal fragments are identified.

Core biopsy [Figure 3] mainly demonstrates a benign fibroepithelial lesion with pericanalicular and intracanalicular architectures. In addition, there is an area with lobular expansion of the native breast parenchyma. In this area, there are crowded, back-to-back acini, but there is otherwise overall preservation of the lobular architecture. The epithelial cells lining the acini have ample clear multivacuolated cytoplasm and enlarged hyperchromatic nuclei. Prominent nuclear hobnailing of the epithelial cells is also identified.

Triple assessment of the breast lump concluded it to be a benign lactating adenoma/fibroadenoma with lactating change. The patient was given appropriate reassurance and managed conservatively.

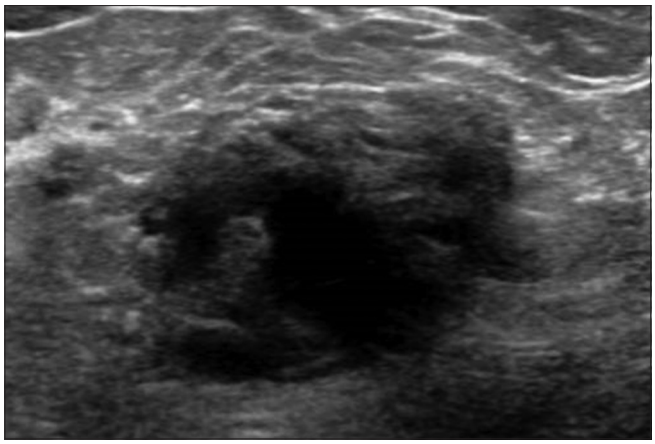

Figure 1: Ultrasonography demonstrated a lobulated heterogeneous nodule with solid and cystic areas, measuring 3.3 cm × 2.0 cm in size. The cystic component was aspirated for fluid cytology, and the remaining solid component was biopsied for histological evaluation

DISCUSSION

Lactating adenoma typically develops during, or shortly after, pregnancy.[1] In general, untreated lactating adenomas undergo spontaneous regression following the end of pregnancy or lactation. While it mostly occurs in the breasts, it may also occur in ectopic breast tissue along the milk line. It is unclear if lactating adenoma represents a specific neoplasm, if it represents nodules of physiologic lobular proliferation that become more prominent than the adjacent breast parenchyma and is clinically evident as a distinct mass, or if it is simply a result of hormone-induced changes occurring within a preexisting fibroadenoma/tubular adenoma during pregnancy.[2-4] Regardless of its etiology, there are diagnostic challenges to be considered. Owing to the native breast parenchyma's florid lobular growth, fibroadipose stromal involution, and increased glandular vascularity during pregnancy, a breast lump may not be well elucidated on clinical examination and imaging.[5,6] In addition, fine needle aspiration cytology may be misled by the hormone-related effects on the TDLU epithelium. These hormone-related effects result in the physiological proliferation of acinar cells with enlarged nuclei, prominent nucleoli, and ample amounts of clear vacuolated cytoplasm. Their cytoplasm, being

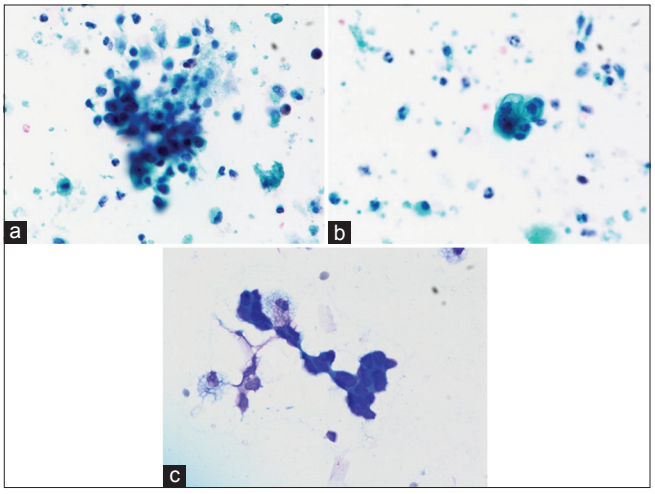

Figure 2: (a) Loosely cohesive group of epithelial cells with enlarged eccentric nuclei and ample cytoplasm. Numerous dissociated, single-occurring epithelial cells are also identified. Some of the epithelial cells demonstrate small but visible nucleoli and coarsely clumped chromatin. Granular debris is present in the background (Pap, ×400). (b) Ample vacuolated cytoplasm is readily appreciated in this small cluster of epithelial cells. This finding, in conjunction with the granular background, should raise the possibility of lactational change, even in the absence of a documented history of recent pregnancy (Pap, ×400). (c) Epithelial cells demonstrate hyperchromatic, overlapping, angulated, enlarged nuclei and high nuclear/cytoplasmic ratio. Bipolar cells are not conspicuous. Taken in isolation, these clusters of epithelial cells might have been interpreted as atypical or suspicious for malignancy. Cyst macrophages and granular debris are present in the background (Diff-Quik ×400)

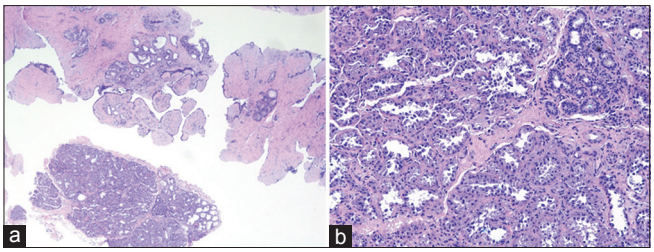

Figure 3: (a) There is an area of fibroadenoma with lactating change (upper half of field) and an area of lactating adenoma (lower half of field). It is unclear if lactating adenoma represents a specific neoplasm or if it is simply a result of hormone-induced changes occurring within a pre-existing fibroadenoma/tubular adenoma during pregnancy (H and E, ×20). (b) A close-up view of the lactating adenoma demonstrates lobular expansion with closely packed acini, but otherwise, there is overall preservation of the lobular architecture. The lumina are generally open and may contain secretions (not seen in this figure). The epithelial cells lining the acini demonstrate enlarged hyperchromatic and hobnailed nuclei, as well as ample clear vacuolated cytoplasm. These changes correspond to the fine needle aspiration cytology findings seen in Figure 2. A terminal duct lobular unit without lactational change is present in the upper right field for comparison (H and E, ×100)

fragile, is often stripped away during the preparation of the cytology specimen, leaving behind a mixture of mainly single-occurring intact epithelial cells and bare nuclei within background granular vacuolated debris.[7]

Taken out of its clinical context and if the granular foamy background was to be ignored, the fluid cytology of this case might have been interpreted as atypical or suspicious for malignancy. Fortunately, the detailed clinical information given in the requisition form, and the accompanying core biopsy of the solid component, allowed for proper clinical-pathological as well as cytological-histological correlations.

The appearance of a smear with numerous single-occurring epithelial cells possessing enlarged nuclei and prominent nucleoli may be misconstrued as evidence of malignancy by the unwary pathologist. Cytomorphometric analyses have demonstrated no statistically significant difference in the nuclear areas of lactating adenoma as compared with those of well-differentiated ductal carcinoma and lobular carcinoma.[8] In the absence of a given clinical history of pregnancy or breastfeeding, appreciation of the distinctive granular vacuolated background and ample vacuolated cytoplasm of the intact epithelial cells is of critical importance.[9] It is also important to bear in mind that features resembling lactational change may be seen focally in women with no history of recent pregnancy; in such instances, the features are referred to as pseudolactational hyperplasia.[10,11]

CONCLUSION

Lactating adenoma is a diagnostic pitfall on aspiration cytology. Without careful consideration of the clinical history and the granular vacuolated cytology background, one may be misled by the presence of numerous single-occurring ductal epithelial cells with enlarged nuclei and prominent nucleoli, which mimics adenocarcinoma. An erroneous diagnosis of malignancy would result in unnecessary anxiety and surgical intervention for the patient.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initial will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Faguy K. Breast disorders in pregnant and lactating women. Radiol Technol 2015;86:419M-38M.
2. Barco Nebreda I, Vidal MC, Fraile M, Canales L, González C, Giménez N, *et al*. Lactating adenoma of the breast. J Hum Lact 2016;32:559-62.
3. O'Hara MF, Page DL. Adenomas of the breast and ectopic breast under lactational influences. Hum Pathol 1985;16:707-12.
4. Slavin JL, Billson VR, Ostor AG. Nodular breast lesions during pregnancy and lactation. Histopathology 1993;22:481-5.
5. Son EJ, Oh KK, Kim EK. Pregnancy-associated breast disease: Radiologic features and diagnostic dilemmas. Yonsei Med J 2006;47:34-42.
6. Vashi R, Hooley R, Butler R, Geisel J, Philpotts L. Breast imaging of the pregnant and lactating patient: Physiologic changes and common benign entities. AJR Am J Roentgenol 2013;200:329-36.
7. Gray W, Kocjan G. Diagnostic Cytopathology. Edinburgh: Churchill Livingstone/Elsevier; 2010. p. 195.
8. Grenko RT, Lee KP, Lee KR. Fine needle aspiration cytology of lactating adenoma of the breast. A comparative light microscopic and morphometric study. Acta Cytol 1990;34:21-6.
9. Prasaad PR. Fine needle aspiration cytologic diagnosis of lactating adenoma: Report of two cases. J Clin Diagn Res 2013;7:2417-8.
10. Shin SJ, Rosen PP. Pregnancy-like (pseudolactational) hyperplasia: A primary diagnosis in mammographically detected lesions of the breast and its relationship to cystic hypersecretory hyperplasia. Am J Surg Pathol 2000;24:1670-4.
11. Koktener A, Cakir B, Akin K, Kosehan D, Bayrak R, Yenidunya S, *et al*. Pregnancy-like (pseudolactational) hyperplasia: Uncommon cause of microcalcifications and mass in two cases. JBR-BTR 2013;96:25-6.