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# Discordant correlation of breast adenoid cystic carcinoma on imaging and pathology: A case report and literature review on surgical management

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## ABSTRACT

**INTRODUCTION:** Adenoid cystic carcinomas (ACC) of the breast are extremely rare tumours, accounting for <0.1% of newly diagnosed breast cancer cases. Little data exist regarding the correlation of radiological findings with histology of this rare subtype. To our knowledge, gross size discrepancy between the 2 modalities has not been reported. We describe a case of ACC with appreciable size discordance between imaging and pathology report.

**PRESENTATION OF CASE:** A 71 years old lady presented with a painless right breast lump of a few months duration. Clinical examination revealed a 1.5 cm right breast upper outer quadrant mass. Axillary and systemic examinations were unremarkable.

Mammogram showed an asymmetric density in the right upper outer quadrant which corresponded to a suspicious nodule measuring about 2 cm on the ultrasound. Ultrasound of the axilla showed an indeterminate right lymph node. Core needle biopsy of the right breast nodule showed ACC while the lymph node biopsy was non- metastatic. Staging scans did not reveal any definite distant metastasis. Her naso-endoscopy and MRI of the neck were normal.

She underwent a right mastectomy and sentinel lymph node biopsy. Final histology returned as a grade II 55 mm ACC. Lympho-vascular invasion was absent. The tumour was triple negative for Estrogen receptor (ER), Progesterone receptor (PR) and Human epidermal receptor 2 (HER 2). Sentinel lymph node biopsy was negative for metastasis.

She recovered well but declined adjuvant chemotherapy and radiation therapy. She is currently well 6 months post operation.

**DISCUSSION:** ACC is an extremely rare subtype, therefore there are limited reports in literature on its imaging and pathological characteristics. Of this sparse data, there was no mention that there might be a big size discrepancy between the 2 modalities.

This appreciable discrepancy has implications for pre-operative planning and the choice of breast surgery. It will be useful if the pathological extent of ACC could be determined more accurately radiologically.

However, there are no distinctive imaging characteristics for ACC. ACC can appear as a smooth round mass similar to that of a benign mass or as an irregular mass on mammogram. On ultrasound, ACC often manifested as a hypo-echoic heterogeneous mass with minimal vascularity on Doppler imaging and may have an indistinct margin. MRI has a higher sensitivity than mammogram and ultrasound in determining the true extent of the tumour, but there remains little data on its usefulness in ACC.

**CONCLUSION:** ACC can be extensively infiltrative and present much larger than its radiological size, as reported in our case. Use of better imaging modalities judiciously, in these cases, are needed to more accurately predict the true pathological size of ACC to prevent inadequate surgery.

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## 1. Introduction

Adenoid cystic carcinomas (ACC) of the breast are extremely rare tumours, accounting for <0.1% of newly diagnosed breast can-

cer cases [1,2]. There is therefore very little data regarding imaging characteristics of ACC and the correlation of the final pathological and imaging size of ACC. There has been no reported concerns of gross size discrepancy between imaging and histological size of ACC.

We describe a case of ACC with appreciable size discordance between imaging and pathology report. This case report was reported in accordance with the SCARE criteria [3].

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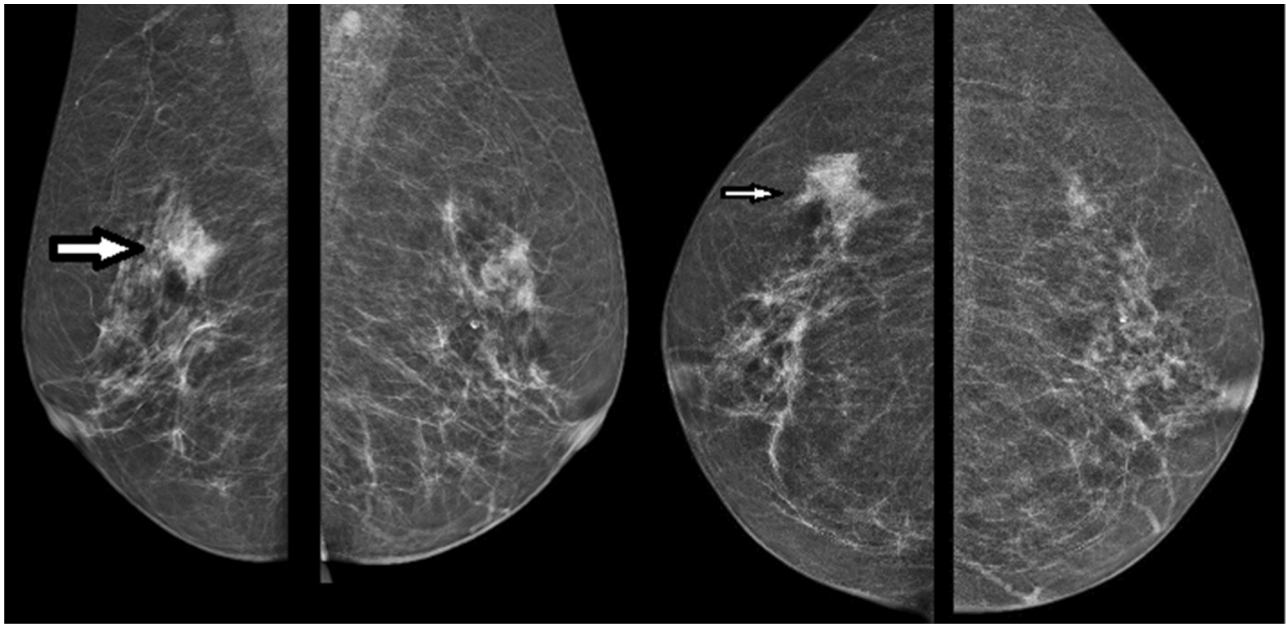


Fig. 1. Mammogram in mediolateral-oblique and cranial-caudal views showing asymmetric density (arrow) in right upper outer quadrant.

## 2. Presentation of case

A 71 years old lady presented to KK Women and Children Hospital Breast Clinic with a painless right breast lump of a few months duration. She has no known past medical history and was not on any regular medications. There was no reported family history of breast cancer. Clinical examination revealed a 1.5 cm right breast upper outer quadrant mass. Axillary and systemic examinations were unremarkable.

Mammogram showed an asymmetric density in the right upper outer quadrant (Fig. 1), which corresponded to a suspicious nodule measuring about 2 cm on the ultrasound (Fig. 2). Ultrasound of the axilla showed an indeterminate right lymph node. Core needle biopsy of the right breast nodule showed ACC while the lymph node biopsy was non-metastatic. Staging scans did not reveal any definite distant metastasis. Her naso-endoscopy and magnetic resonance imaging (MRI) of the neck were normal.

Surgical options of breast conservation or mastectomy with reconstruction were offered. She opted for a right mastectomy with sentinel lymph node biopsy. She was not keen for breast conservation as she was keen to avoid radiotherapy. The operation was done one month from presentation and clinical examination on the day of surgery did not reveal any appreciable change in tumour size. The operation was uneventful. Histology showed an extensively infiltrative tumour characterized by solid and cribriform nests, trabeculae of basaloid tumour cells intimately admixed with hyalinised and myxoid stroma (Fig. 3). Cribriform nests contained basophilic myxoid material with focal calcification and eosinophilic basement membrane material (Fig. 4). Immunohistochemistry revealed a dual population of intimately admixed luminal epithelial cells (CK7+, CD117+) and myoepithelial cells (p63+). The morphological features were those of an ACC. No ductal carcinoma in situ (DCIS) was seen. The tumour was grade II and measured 55 mm.

Lympho-vascular invasion was absent. The tumour was triple negative for estrogen receptor (ER), progesterone receptor (PR) and human epidermal receptor 2 (HER 2). Sentinel lymph node biopsy was negative for metastasis.

She recovered well but declined adjuvant chemotherapy and radiation therapy. She is currently 12 months post operation and is well. She will be on lifelong follow up with the breast surgeon.

## 3. Discussion

ACC is an extremely rare subtype, therefore there are limited reports in literature on its imaging and pathological characteristics. From this sparse data, there is no mention that there might be a big size discrepancy between the 2 modalities. However, microscopic extent of ACC had been described to extend beyond a macroscopic well defined border in 50–60% of cases [4]. We report a case of ACC with gross size discrepancy between the radiological and pathological measurement, emphasizing that the radiologic findings could underestimate the true extent of this rare subtype, especially if it was of an extensively infiltrative tumour as seen in our case.

There are no distinctive imaging characteristics for ACC. ACC may appear as a smooth round mass similar to that of a benign mass or as an irregular mass on mammogram [5], like in our patient. Micro-calcifications are rarely seen on mammogram [6]. On ultrasound, ACC often manifests as a hypo-echoic heterogeneous mass with minimal vascularity on Doppler imaging and may have an indistinct margin [7,8], similar to our case. In our case, the tumour measured 20 mm on imaging, much smaller than its final histological size of 55 mm. This appreciable discrepancy has implications for pre-operative planning and the choice of breast surgery. It would be useful if the pathological extent of ACC could be determined more accurately radiologically. She was fortunate to have chosen a mastectomy as her margins may have been involved if a wide excision was done based on an expected 20 mm tumour size.

MRI has higher sensitivity [8] than mammogram and ultrasound in determining the true extent of the tumour, but there is little data on its usefulness in ACC. On MRI, ACC can present as a mixed solid-cystic mass with indistinct margin associated with internal septations on T2 weighted image, that exhibits delayed enhancement on MRI [7]. However, there is currently inadequate data to support the routine use of MRI for pre-operative planning. The application of MRI in this rare subtype needs to be further defined.

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