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Adenomyoepithelioma of the breast with malignant transformation and repeated local recurrence: A case report

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Abstract

BACKGROUND

Adenomyoepithelioma (AME) of the breast is a rare type of benign breast tumor. Many AMEs show benign behavior, but reports of the malignant type are rare. We present the case of a patient with AME with repeated local recurrences and further malignant transformation.

CASE SUMMARY

A 53-year-old woman visited our hospital with a 16-mm palpable mass in the right breast. A core needle biopsy was performed. The pathological diagnosis was AME. Lumpectomy with a safety margin was performed without axillary lymph node dissection (ALND). Two years later, local recurrence developed, and the patient again underwent lumpectomy with a safety margin. The pathology showed malignant AME, and the margin was negative. Eight months later, local recurrence developed again in the same location, and a total mastectomy was performed without ALND. The pathological diagnosis was malignant AME. The patient was disease-free for three years posttreatment.

CONCLUSION

The treatment of AME requires caution, as it may exhibit repeated recurrences after local excision as well as malignant transformation.

Key Words: Breast tumor; Adenomyoepithelioma; Malignant adenomyoepithelioma; Local recurrence; Malignant transformation; Case report

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Core Tip: Adenomyoepithelioma (AME) of the breast is a very rare type of benign tumor of the breast. Many AMEs demonstrate benign behavior and are often cured with excision with negative margins, but some AMEs exhibit malignant transformation of the myoepithelium, glandular epithelium, or both. We report the case of a patient with AME with repeated local recurrences and malignant transformation.

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INTRODUCTION

Adenomyoepithelioma (AME) is a very rare type of benign tumor of the breast. Many AMEs demonstrate benign behavior and are often cured with excision with negative margins, but some AMEs exhibit malignant transformation of the myoepithelium, glandular epithelium, or both[1-4]. However, cases of repeated recurrences despite negative excision margins are very rare. We report the case of a patient with malignant transformation after repeated wide local excisions of AME.

CASE PRESENTATION

Chief complaints

A 53-year-old Japanese woman presented with a right breast mass at the site of a previous wide local excision of AME.

History of present illness

A 53-year-old Japanese woman visited our hospital with a palpable mass approximately 2 cm in size in the upper-inner right breast. The mammogram showed an oval, smooth, and well-defined isodense mass in the upper right breast (Figure 1A). Diagnostic ultrasonography showed a well-defined mass with cystic change, measuring up to 16 mm, at the 2 o'clock position in the right breast (Figure 1B). A core needle biopsy (CNB) was performed, and the lump was diagnosed as AME. Lumpectomy with safety margins and without axillary lymph node dissection (ALND) was performed. Postoperative pathology confirmed AME. The tumor was a 20-mm cystic lesion, and the cystic wall had nodules or irregular thickening (Figure 1C). The microscopic findings were as follows. Round or spindle-shaped myoepithelium that had proliferated in and around the gland ducts. High mitotic counts were prominent in the myoepithelial component (8/10 high-power fields.) The border of the tumor was relatively clear (Figure 1D). The tumor resection margins were relatively clear with at least 5 mm clearance at the nearest margin. No adjuvant therapy was given. Two years later, the woman returned to our hospital with a palpable mass in the same location. Ultrasound showed a well-defined, oval, low-isoechoic mass on the slightly caudal side of the area of postoperative change (Figure 2A). Vacuum-assisted biopsy was performed, and the diagnosis was recurrent AME. Lumpectomy with safety margins and without ALND was again performed. The tumor was diagnosed as recurrent AME with a proliferation pattern similar to that at the initial surgery. In addition, a diagnosis of malignant transformation of AME was made due to the observation of nuclear atypia, a high mitotic count (approximately 10/10 high-power fields), and invasive growth (Figure 2B-E). Excisional margins were narrow on the side of the pectoralis major muscle, but the tumor was not exposed. No adjuvant therapy was given. Eight months later, the patient presented with a recurrent palpable mass in the same area.

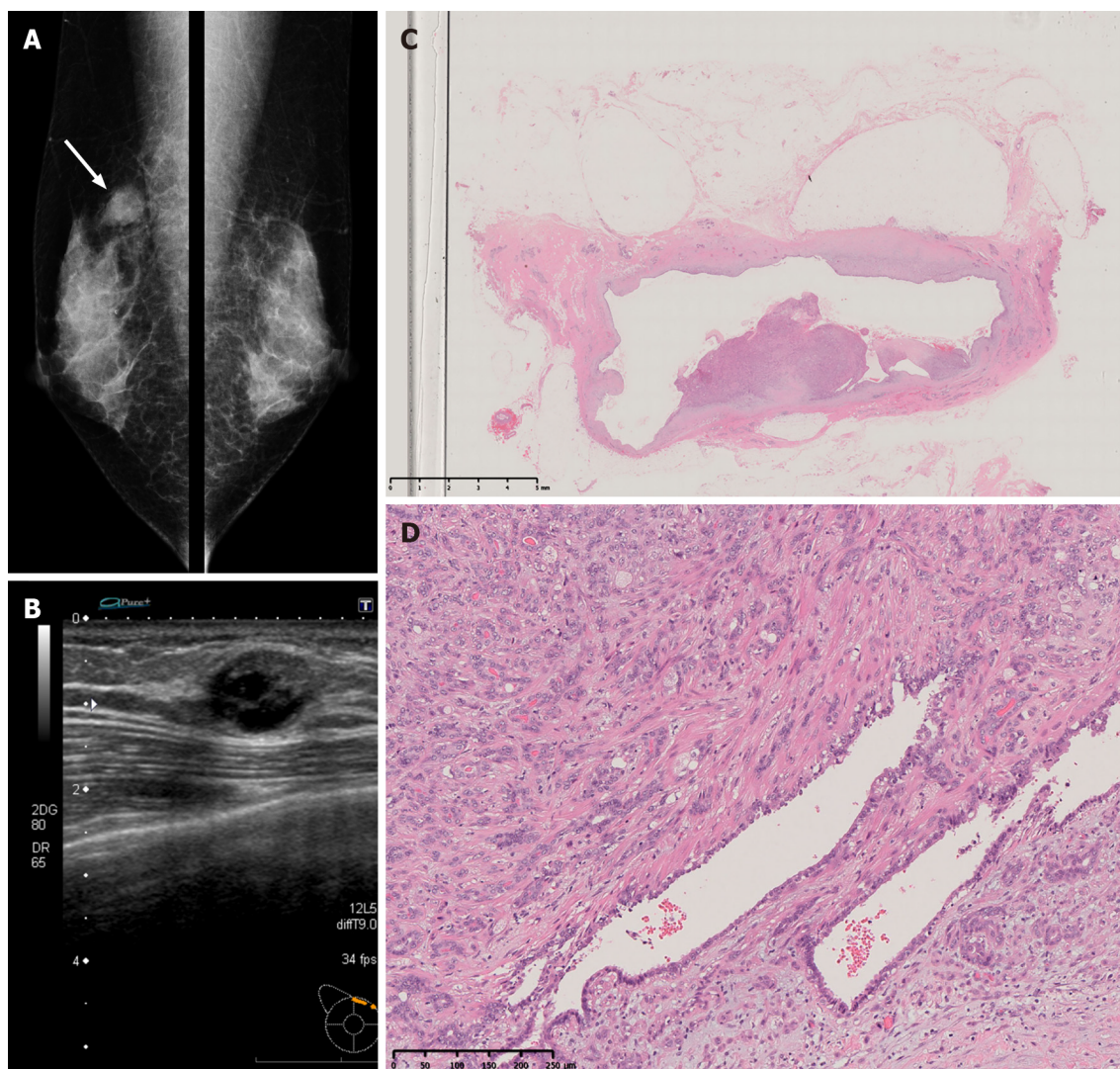


Figure 1 Imaging and pathology findings at the time of the initial surgery. A: The mammogram showed an oval, smooth, well-defined, isodense mass in the upper right breast (white arrow); B: Ultrasonography showed a well-defined mass with cystic changes, measuring up to 16 mm, at the 2 o'clock position of the right breast; C: The tumor was a cystic lesion, and the cystic wall had nodules or irregular thickening ($\times 65$ magnification); D: Round or spindle-shaped myoepithelium proliferating in and around the gland ducts was observed. High mitotic counts were prominent in the myoepithelial component ($\times 100$ magnification).

History of past illness

No special past medical treatment history.

Personal and family history

No family history of breast cancer or other cancers.

Physical examination

An approximately 2 cm palpable mass was observed in the upper-inner area of the right breast.

Laboratory examinations

The patient's hematology and biochemistry results were all unremarkable.

Imaging examinations

Ultrasound showed a series of masses up to 27 mm in size that had formed on the right side of the previous surgical wound (Figure 3A). The largest of the masses showed no echogenicity, thick walls and internal septal/cystic degeneration. The findings were similar to those of the patient's previously diagnosed AME. Enhanced breast magnetic resonance imaging (MRI) showed multiple masses up to 25 mm in size in the right inner-upper area (Figure 3B). The masses were cystic with thick walls, similar to the previous tumor, and the patient was diagnosed with recurrence. Two 7-

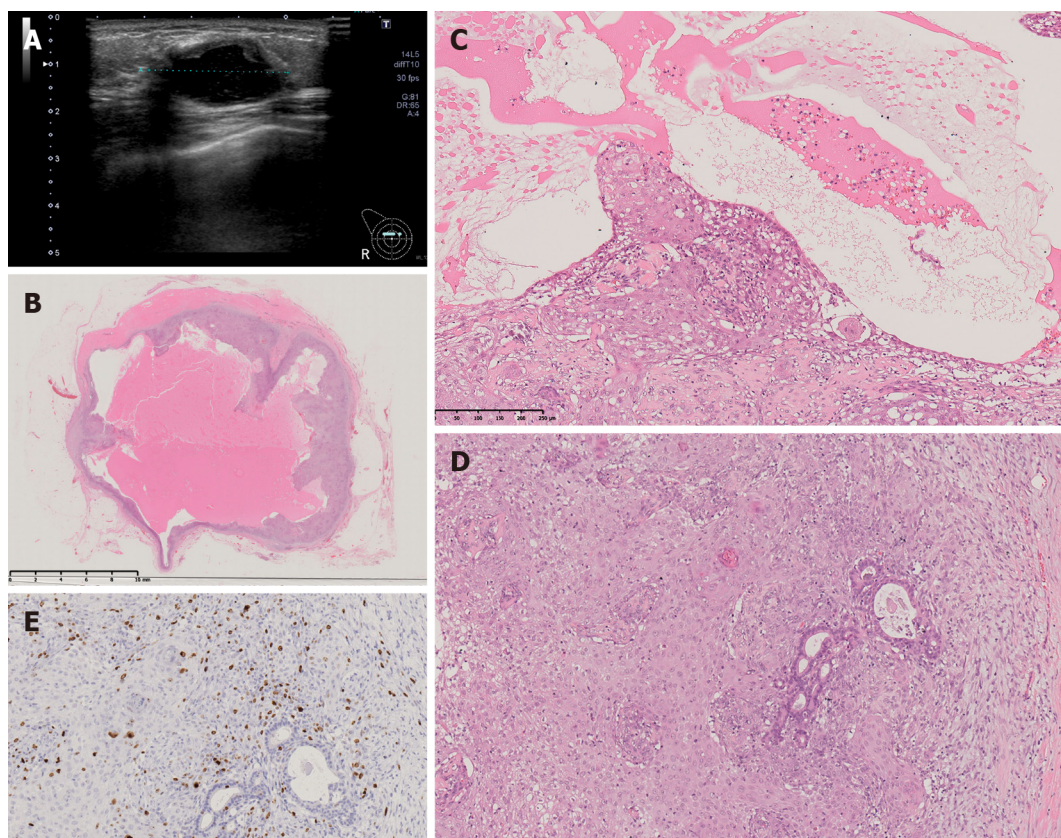


Figure 2 Imaging and pathology findings at first recurrence. A: Ultrasonography showed a well-defined, oval, low-isoechoic mass; B: The tumor was a cystic lesion, and the cystic wall had nodules or irregular thickening. The cysts contained mucus ($\times 32$ magnification); C and D: Epithelium with squamous metaplasia growing into the luminal side (C: $\times 100$ magnification, lumen side) and (D: $\times 100$, membrane side). Dense growth of spindle-shaped myoepithelium is found on the side of the membrane. The myoepithelium spreads underneath the existing glandular epithelium. Tumor cells show prominent nuclear atypia and high mitotic counts; E: The Ki 67 hot spot is 57.1% ($\times 100$ magnification, Ki67).

mm nodules were also found within the pectoralis major muscle.

FINAL DIAGNOSIS

The tumor was 75 mm \times 24 mm in size and located in the inner-upper area. The center of the lesion was hollow and cystic, and the lesion contained a jelly-like substance (Figure 3C). The pathological findings were the same as those in the previous recurrence (Figure 3C-E). Epithelium with squamous metaplasia and spindle-shaped myoepithelium arranged in a complex or bundled pattern were present, and there was continuity between the two types of epithelium; the epithelial cells showed prominent nuclear atypia and high mitotic counts that were especially prominent in the squamous epithelial component. There were also findings of invasion of the partially resected pectoralis major muscle and extramammary adipose tissue. The diagnosis of recurrent AME with malignant transformation and squamous differentiation was made.

TREATMENT

Total mastectomy and partial resection of the pectoralis muscle were performed without ALND. No adjuvant therapy was given.

OUTCOME AND FOLLOW-UP

Mammogram, breast US, and chest X-ray were performed regularly. The patient was disease-free for three years posttreatment.

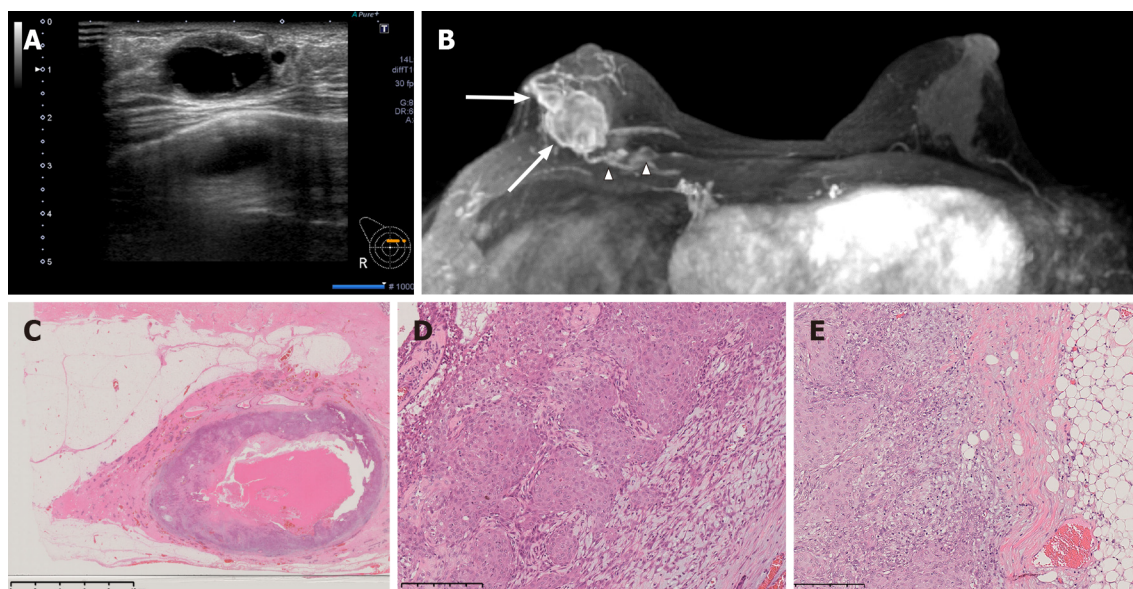


Figure 3 Imaging and pathology findings at the 2nd recurrence. A: Ultrasonography shows a series of masses of up to 27 mm located on the right side of the previous surgical wound; B: Enhanced breast magnetic resonance imaging showed multiple masses up to 25 mm in the right inner-upper area (white arrow). The masses were cystic with thick walls, similar to the previous tumor, and were diagnosed as recurrent adenomyoepithelioma. Two 7-mm nodules were also found within the pectoralis major muscle (arrowhead); C: The tumor was a cystic lesion, and the cystic wall had nodules or irregular thickening. The cyst contained mucus ($\times 3$ magnification); D: Biphasic proliferation of both inner epithelium with squamous metaplasia and outer spindle-shaped myoepithelium was seen ($\times 100$ magnification). Both cell types showed prominent nuclear atypia and high mitotic counts that were especially prominent in the epithelial component. The histological findings were the same as those of the previous surgery; E: The tumor cells invaded the extramammary adipose tissue.

DISCUSSION

AME of the breast is a rare disorder characterized by the simultaneous proliferation of glandular epithelium and myoepithelium. Characteristically, AMEs tend to exhibit benign clinical behavior, although malignant transformation has been reported in a small number of cases. Patients diagnosed with malignant AME over the last 5 years are summarized in Table 1[5-14]. The age distribution ranged from 36 to 78 years (mean 53.0 years). The modalities used for diagnosis and the procedures performed are described below as appropriate.

The malignant transformation of AME is indicated by features such as prominent cytological atypia, an elevated mitotic index, necrosis, and metastasis. Because of the biphasic nature of the tumor, carcinomas may arise from the glandular epithelium, myoepithelium, or both. In the present case, the proliferation of the myoepithelium was initially more prominent than that of the glandular epithelium in the initial surgical specimen. At the time of recurrence, the glandular epithelium was eradicated, and the tumor was mainly myoepithelium and epithelium with squamous metaplasia. The proportion of myoepithelium and glandular epithelium proliferation differs from case to case. The case of a patient with different proportions in the metastatic site and the primary tumor has also been reported[12]. Malignant transformation at the time of local recurrence has been reported, but the number of cases is small[8,12,15]. Our patient experienced repeated local recurrences despite negative margins and eventually required a total mastectomy. Most AMEs can be treated by local excision, but local recurrences have been found to occur 8 mo to 5 years after the initial excision [8,12]. Recurrence despite negative surgical margins is very rare[12].

There were no specific mammography findings indicative of a diagnosis of AME described in previous studies. Most reports describe a hypoechoic mass on US, but there have been cases with cystic degeneration, as in the present case[6,12]. Although MRI has only been described for a few AME patients, MRI is useful in some cases, such as for our patient, because it can reveal invasion of the surrounding tissue[6,9,12]. Although most patients undergo preoperative CNB, care should be taken to avoid misdiagnoses, as the pathological findings may indicate other tumors, including phyllodes tumors[7], papillomas[8] or noninvasive carcinomas[13].

There are no clear treatment guidelines for AME. Lumpectomy with a safety margin or quadrantectomy is often performed, and total mastectomy is sometimes performed for large or suspected malignant tumors[5,6,8,11-13,16]. Incomplete resection or malignant transformation is a risk factor for local recurrence, but it is important to note

Table 1 Malignant adenomyoepithelioma cases reported over the last 5 years

No	Ref.	Age	Malignant components	Surgery	Local recurrence	Distant recurrence	Outcome	MMG	US	MRI	Biopsy
1	Jones <i>et al</i> [5]	78	Epithelial and myoepithelial	Lumpectomy→mastectomy+SNB	No	No	1-yr survival	NA	NA	NA	CNB(suspicious for AME)
2	Yuan <i>et al</i> [6]	51	NA	Lumpectomy→lumpectomy→mastectomy+SNB	Unknown	Unknown	Unknown	Mass	Cyst-solid space-occupying lesions	Enhanced mass with suspected invasion of surrounding tissue	CNB (suspicious for AME)
3	Yuan <i>et al</i> [6]	58	NA	Lumpectomy→mastectomy	Yes	Yes (bone, carcinomatous pleurisy)	Died after 22 months	NA	NA	NA	CNB (suspicious for AME)
4	Hempenstall <i>et al</i> [7]	45	Epithelial and myoepithelial	Lumpectomy	No	No	Survival (period unknown)	Mass	Heterogeneously hypoechoic mass	NA	CNB (diagnosis of phyllodes tumor)
5	Watanabe <i>et al</i> [8]	41	Epithelial and myoepithelial	Lumpectomy→mastectomy	Yes	Yes (lung)	Unknown	Mass	NA	NA	CNB (diagnosis of papilloma)
6	Kakkar <i>et al</i> [9]	36	Myoepithelial predominant	Lumpectomy+SNB	No	No	1-yr survival	Mass	NA	Lobulated mass with infiltrative margins	CNB (diagnosis of invasive carcinoma)
7	Febres-Aldana <i>et al</i> [10]	47	Epithelial and myoepithelial	Lumpectomy	No	No	1-yr survival	Mass	NA	NA	CNB (diagnosis of malignant AME)
8	Lari <i>et al</i> [11]	39	Epithelial and myoepithelial	Lumpectomy→mastectomy+ALND	No	No	Unknown	Ill-defined irregular mass	Low echoic mass	NA	CNB (suspicious for AME)
9	Moro <i>et al</i> [12]	64	Epithelial and myoepithelial	Lumpectomy→mastectomy+ALND	Yes	Yes (lung)	Died 17 months later	NA	Hypoechoic mass with cystic lesion	Multiple masses with invasion of the skin and pectoralis muscle	CNB (diagnosis of AME)
10	Zhang <i>et al</i> [13]	64	Malignant degeneration of the myoepithelium	Lumpectomy+SNB	No	No	1-yr survival	Mass	Hypoechoic mass	NA	Excisional biopsy(diagnosis of ductal carcinoma)
11	Parikh <i>et al</i> [14]	61	Epithelial and myoepithelial	Lumpectomy	No	No	Unknown	FAD	Heterogeneously hypoechoic	NA	CNB(suspicious for AME)
12	Our case	53	Myoepithelial predominant	Lumpectomy→lumpectomy→mastectomy	Yes	No	2-yr survival	Mass	Mass with cystic change	Multiple masses with cystic change with invasion of the pectoralis muscle	CNB(diagnosis of AME)

NA: Not applicable; SNB: Sentinel node biopsy; ALND: Axillary lymph node dissection; MMG: Mammography; FAD: Focal asymmetric density; CNB: Core needle biopsy; AME: Adenomyoepithelioma.

that local recurrence can occur even with clearly negative margins in a benign lesion, as observed in our patient. It will become clearer as more cases are reported which patients should undergo total mastectomy and whether reconstruction is possible after resection. Axillary lymph node metastases are rare. Cases of axillary dissection have been reported[11,12], but the data on the indication for this approach and its efficacy are inconclusive. There are no data about adjuvant radiotherapy and/or chemotherapy. Therefore, adjuvant therapy was not administered in the present case.

CONCLUSION

To conclude, we report a rare case of a patient with AME with repeated local recurrences and further malignant transformation despite negative excisional margins. AME may recur repeatedly even after lumpectomy with safety margins, as in the present case, and the patients should be carefully monitored.

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