# Epidermal inclusion cyst of the breast: a rare benign entity

Lam S Y, Kasthoori J J, Mun K S, Rahmat K


## ABSTRACT

**Epidermal inclusion cyst (EIC) arising from the breast is an uncommon benign condition. We report two cases of enlarging EIC of the breast in two women in their forties. The diagnosis of this condition may not be straightforward with imaging alone if an EIC presents as an enlarging lump in the breast and mimics a benign breast lesion, most commonly a fibroadenoma or malignant lesion with benign imaging features. Excision is usually recommended for a definite histopathological diagnosis and for the prevention of potential risks of malignant transformation. Asymptomatic stable lesions do not require treatment; biopsy is unnecessary, and follow-up imaging suffices if typical sonographic and clinical findings are found.**



**Keywords: enlarging palpable breast lump, epidermal inclusion cyst, mammography, sonography**

*Singapore Med J 2010;51(12):e191-e194*


## INTRODUCTION

Epidermal inclusion cyst (EIC) of the breast is an uncommon benign condition and is usually located in the skin layer. EIC refers to cysts that result from the proliferation and implantation of epidermal elements within a circumscribed space in the dermis. Such cysts can occur anywhere in the body although they are more common on the face, trunk, neck, extremities and scalp. The occurrence of EIC in the skin of the breast is rare. Lesions of such nature are frequently thought to be breast lumps, and are not included as one of the main differential diagnoses of benign breast lesions. We report two cases of enlarging EIC of the breast in two women in their forties.

## CASE REPORTS

### Case 1

A 47-year-old woman was referred to our hospital for evaluation of a palpable lump in her right breast. She had vaguely felt this mass at the site of her previous surgery for the past five years. The patient had a lumpectomy for a benign breast lesion 16 years ago. However, over the past month, the mass had rapidly grown in size and was slightly painful. Physical examination revealed a round firm lesion adherent to the overlying skin in the lower inner quadrant of the right breast. A scar was seen overlying this mass. No lymph nodes were felt in the axillary region.

Mammography revealed a smoothly outlined dense oval mass with a surrounding lucent halo in the right lower inner quadrant, suggestive of a benign breast lesion (Fig. 1a). Ultrasonography then showed a solid, heterogeneously hypoechoic, well-circumscribed mass measuring 3.1 cm × 2.3 cm. No colour flow signal was demonstrated within the lesion. Extension of the mass into the dermis was observed, and a cutaneous origin was suggested (Fig. 1b). Based on the clinical and imaging findings, differentials such as fibroadenoma, sebaceous cyst and epidermal inclusion cyst were suspected.

As the patient was very anxious about the sudden increase in the size of the cyst, fine-needle aspiration of the lesion was performed at the patient's request. Thick yellowish viscid material was aspirated during the biopsy, confirming the cystic nature of the lesion. Cytologic examination revealed numerous clumps of mature squamous cells with small amounts of anucleate keratin. There were no other cellular elements present. The findings were consistent with a benign epidermal cyst (Fig. 1c).

### Case 2

A 42-year-old Indian woman with no background medical history first presented to the outpatient department with complaints of a painless lump in her right breast, which had increased in size over the past one-and-a-half years. There were no associated complaints of nipple discharge or skin changes, and the patient had no history of previous surgery or infection to the breast. No previous consumption of hormonal medications or a family history of breast disease was elicited from the patient. She was referred to the breast clinic.

On examination, the lump was located at the lower outer quadrant of the right breast and measured approximately 2.0 cm × 1.0 cm. It was hard, immobile and was fixed to the overlying skin. There was no skin


**Department of Biomedical Imaging, Faculty of Medicine, University of Malaya Medical Centre, Kuala Lumpur 50603, Malaysia**

Lam SY, MBBS, MRad
Lecturer

Kasthoori JJ, MBBS, FRCR, MRad
Senior Lecturer

Rahmat K, MBBS,
Associate Professor

**Department of Pathology**

Mun KS, MBBS, MPath
Senior Lecturer

**Correspondence to:**
Dr Lam Sze Yin
Tel: (60) 1334 79698
Fax: (60) 3794 94603
Email: szeyin.lam@gmail.com

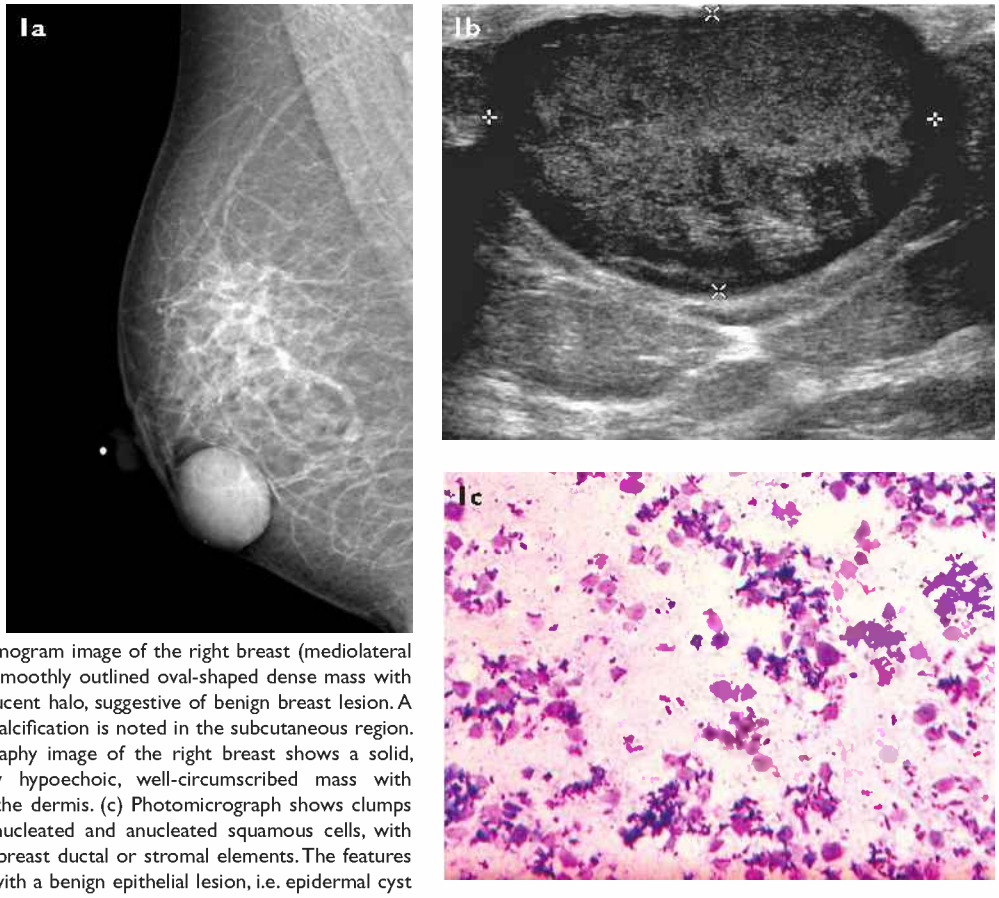



**Fig. 1** (a) Mammogram image of the right breast (mediolateral view) shows a smoothly outlined oval-shaped dense mass with a surrounding lucent halo, suggestive of benign breast lesion. A speck of microcalcification is noted in the subcutaneous region. (b) Ultrasonography image of the right breast shows a solid, heterogeneously hypoechoic, well-circumscribed mass with extension into the dermis. (c) Photomicrograph shows clumps and sheets of nucleated and anucleated squamous cells, with no evidence of breast ductal or stromal elements. The features are consistent with a benign epithelial lesion, i.e. epidermal cyst (May-Grünwald-Giemsa stain, × 40).

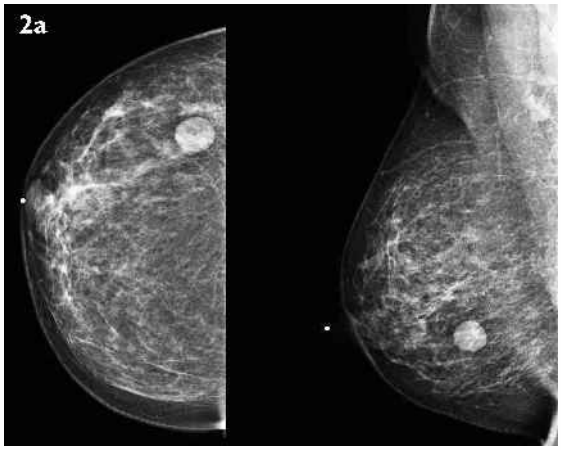
change, nipple retraction or enlarged axillary lymph nodes. A mammogram revealed a well-circumscribed high-density oval lesion in the lower outer quadrant of the right breast, with no architectural distortion or calcifications (Fig. 2a). The left breast was normal. Subsequent ultrasonography of this lesion showed a well-circumscribed heterogeneous mass measuring 1.6 cm × 1.2 cm with posterior enhancement at the 7–8 o'clock position (Fig. 2b). No increased vascularity was demonstrated. Retrieval of the patients previous mammogram performed 18 months ago showed a mass measuring 0.7 cm × 0.7 cm, and it was reported as a fibroadenoma (BIRADS 2).

A tru-cut biopsy was planned, but prior to the injection of local anaesthesia, "sebaceous" material was aspirated from this mass. Hence, an excision biopsy was carried out instead. The gross appearance of the biopsy specimen was an ellipse of skin with a ruptured cystic lesion noted below the skin, with fragments of brownish cyst contents. Microscopic findings revealed the presence of a cyst in the dermis, which was lined by keratinised stratified squamous epithelium containing keratin flakes. No malignancy was noted (Fig. 3). The final diagnosis of an EIC was made.

## DISCUSSION

Based on the English language literature reviews, fewer than 40 cases of EIC developing in the breast have been reported.[1] A few theories regarding their aetiology have been postulated, namely congenital development of the cyst secondary to obstructed hair follicles or pores, injury to the epidermis resulting in epidermal fragments being implanted more deeply within the breast tissue or developed following squamous metaplasia of normal columnar cells within a dilated duct in cases of fibrocystic disease, or within a fibroadenoma or phyllodes tumours.[1-4] In our first case, the pathogenesis of the EIC may have been due to epidermal trauma as a result of a previous breast biopsy and lumpectomy.

EIC typically appears to be well circumscribed with homogeneous increased density on mammography.[1,5] On sonography, breast EIC may have a solid, well-circumscribed and complex or heterogeneous appearance. Crystal and Shaco-Levy described the specific sonographic features of breast EIC as an onion-ring appearance, with alternating concentric hyperechoic and hypoechoic rings corresponding to the pathologic features of lamellated keratin.[6] In addition, Denison et al in their report on cysts, described another



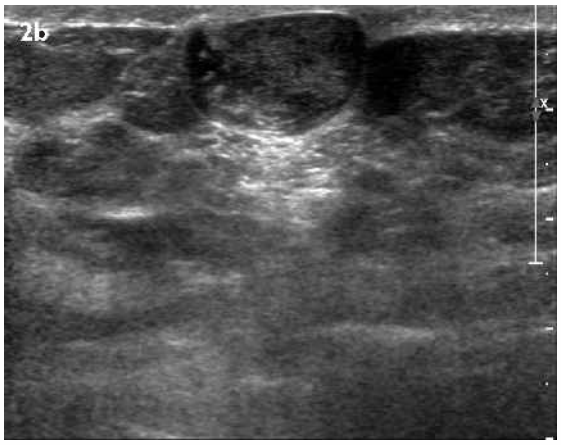
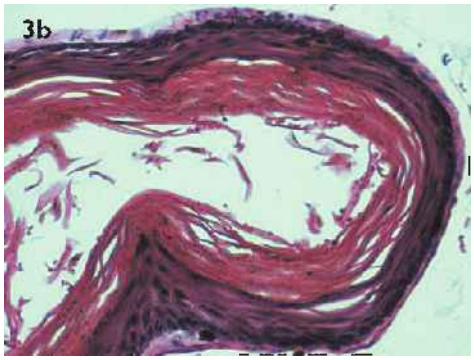




**Fig. 2** (a) Mammogram images of the right breast (craniocaudal and mediolateral views) show a well-circumscribed, high-density, oval-shaped lesion in the lower outer quadrant. (b) Ultrasonography image of the right breast shows a well-circumscribed, heterogeneous hypoechoic mass extending into the dermis with posterior enhancement.

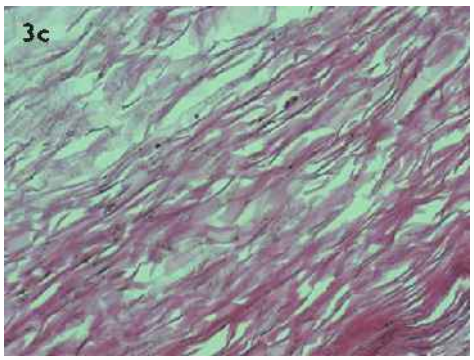




**Fig. 3** Photomicrographs show (a) low power (Haematoxylin & eosin, × 20) and (b) high power (Haematoxylin & eosin, × 100) views of the cyst wall, (c) which is lined by keratinising stratified squamous epithelium and contents of the cyst comprising anucleate squames (Haematoxylin & eosin, × 100).

specific sonographic feature of breast EIC – its extension into the dermis,[7] as seen in our two patients.

The diagnosis is straightforward when EIC occurs as a small nodule in the subcutaneous tissue of the breast.[1] However, EIC occurring in the breast parenchyma can occasionally be misdiagnosed based on imaging alone, especially if it presents as a breast lump with mammographic and sonographic images mimicking a fibroadenoma or phyllodes tumour, or even a malignant breast lesion with benign features such as mucinous carcinoma.

In view of its uncommon occurrence and in the hands of less experienced clinicians and radiologists, a palpable breast lump with a mammographic and sonographic appearance of a well-circumscribed solid hypoechoic mass is more likely to be thought of as a fibroadenoma, as in our second patient. In addition, in view of the increasing size of the lesion, tissue diagnosis was carried out to exclude carcinoma with a well-defined border.

Although epidermal inclusion cysts are known to be benign, they may rarely have malignant potential, with transformation into squamous cell carcinoma. Menville et al found that 19% of the patients with EIC in his case series showed malignant squamous cell lining on histopathological examination.[8] However, Cameron and Hilsinger reported that malignant transformation of the cyst wall epithelium occurs very rarely (0.045%).[9] As the incidence of EIC occurring in the breast parenchyma is small, with variable reports on the incidence of its malignant change, the actual percentage is uncertain.

Therefore, asymptomatic stable lesions do not require treatment; biopsy is unnecessary, and follow-up imaging suffices if typical sonographic and clinical findings are found. However, in symptomatic cases

presenting with an enlarging palpable breast lump, even with typical sonographic appearances, excision is usually recommended for definitive histopathological diagnosis so as to exclude a malignant lesion with benign imaging features, and for the prevention of potential risk of malignant transformation.

## REFERENCES


1. Taira N, Aoji K, Ohsumi S, et al. Epidermal Inclusion Cyst of the Breast. Breast Cancer 2007; 14:434-7.
2. Chantra PK, Tang JT, Stanley TM, Bassett LW. Circumscribed fibrocystic mastopathy with formation of an epidermal inclusion cyst. Am J Roentgenol 1994; 163:831-2.
3. Gerlock AJ. Epidermal inclusion cyst of the breast associated with needle aspiration biopsy. Radiology 1974; 112:69-70.
4. Davies JD, Nonni A, D'Costa HF. Mammary epidermoid inclusion cysts after wide-core needle biopsies. Histopathology 1997; 31:549-51.
5. Morris PC, Cawson JN, Balasubramaniam GS. Epidermal cyst of the breast: detection in a screening programme. Australas Radiol 1999; 43:12-5.
6. Crystal P, Shaco-Levy R. Concentric ring within the breast mass on sonography: lamellated keratin in an epidermal inclusion cyst. Am J Roentgenol 2005; 184(3 suppl):47-8.
7. Denison CM, Ward VL, Lester SC, et al. Epidermal inclusion cysts of the breast: three lesions with calcifications. Radiology 1997; 204:493-6.
8. Menville JG. Simple dermoid cyst of the breast. Ann Surg 1936; 103:49-56.
9. Cameron DS, Hilsinger RL. Squamous cell carcinoma in an epidermal inclusion cyst: case report. Otolaryngol Head Neck Surg. 2003; 129:141-3.