

SONOGRAPHICALLY DIAGNOSED COMPLEX OR COMPLICATED BREAST CYST WITH HISTOPATHOLOGICAL CORRELATION TO SPECIFICALLY ADDRESS THE NEED FOR INTERVENTION

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ABSTRACT

Objective: This study was undertaken to find out the histological basis for sonographically diagnosed complex or complicated breast cyst and to specifically address the need for intervention based on sonographic features. **Methods:** From a retrospective review of 350 ultrasound guided breast interventions during two year period, 62 procedures were selected which were performed for complex breast cysts in 54 patients. Mean lesion size was 22mm. Diagnosis was established with fine needle aspiration under ultrasound guidance, core needle biopsy or excisional biopsy for small cyst after ultrasound guided bracketing in 34, 10 and 18 patients respectively. **Results:** Out of these 62 lesions, 50 lesions were characterized as thin walled cysts with fine internal echoes and thin septations sonologically. None proved malignant on cytology. 7 lesions were thick walled cysts with internal septation > 5mm, which on histopathology turned out to be either infected galactocoele (n=1) or breast abscesses (n=6). 5 lesions were solid cum cystic masses with cystic predominance, 4 of these were malignant, and one was fibroadenoma with cystic change. In malignant lesions three were invasive ductal carcinomas grade 3 and one was lobular carcinoma. **Conclusion:** Complex cyst with thin wall and low-level internal echoes and thin internal septation with septal thickness less than 3mm are mostly benign and need short term follow up. However, Complex cystic masses with thick indistinct wall and thick septation or solid cum cystic masses with eccentric cystic foci should be biopsied.

KEY WORDS: Breast Cyst, Ultrasound, Intervention

Introduction

Breast ultrasound has an established role in the evaluation of breast abnormalities especially in women under 40 years of age^{1,2,4} The increasing use of ultrasound in breast diagnosis has resulted in the frequent identification of incidental benign-appearing lesions.^{2,3} Clinicians involved in the management of women with breast abnormalities are frequently dealing with imaging findings that are not considered suspicious, but raise a small possibility of malignancy. Intervention, in the form of ultrasound-guided needle or core biopsy, is increasingly available and relatively non-invasive.⁴ It may therefore be considered a simple solution in terms of diagnosis and reassurance to the patient. However, intervention is not without complications or

cost. The avoidance of unnecessary biopsy in a significant proportion of women may be just as important as the detection of cancer in a very small number of women. Of these incidental benign-appearing lesions, the so-called complex cyst (also known as atypical or complicated) is possibly the most challenging finding.^{3,4}

Complex breast cysts are reported in approximately 5% of women who undergo ultrasound examination.^{5,8} Complex breast cysts may be caused by normal physiological changes (such as inspissated cyst content) or may be a result of artifact (also known as pseudo complex cyst) which may be partly resolved with optimal scanning or technological improvements, but sometimes they represent a malignant process.^{5,6,3} This study was undertaken to determine the clinical significance of complex cysts and the most appropriate and effective management strategy to specifically address the need for intervention according to the sonographic findings with pathological correlation.

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Materials and Methods

This descriptive study was carried out at AKU Radiology department from Jan 2004-Jan 2006. All Lesions with prospectively recorded cystic component at sonography were included in the study and the exclusion criteria was acute inflammatory lesions and small hypoechoic lesions with absent posterior acoustic enhancement, which turned out to be solid on biopsy. Preprocedure sonogram was done in our institution on GE logic 500 or Aloka Prosound 4000 using a 7MHz linear probe. Sonographic criteria used for classification of Complex cyst was the presence of fine internal echoes and thin septation <3mm (complicated cyst), small hypoechoic lesions with absence of definite posterior acoustic enhancement due to diffuse internal echoes, perceptible wall with thick septations > 5mm and solid cum cystic masses with cystic predominance (complex cystic masses).

During this 2 year period, 350 ultrasound guided breast interventions were performed in our department, out of which 62 procedures were performed for complex breast cyst in 54 patients with age range of 28 to 76 years (mean, 51 years). Mean lesion size was 22mm. Out of 62 lesions 14 lesions were palpable. Diagnosis was established with fine needle aspiration (Fig. 1) under ultrasound guidance in 34 patients. Fluid was withdrawn by using an 18-20 gauge needle and sent for cytology and culture. In 10 patients core needle biopsy was performed with the help of 14 gauge automated biopsy gun. Excisional biopsy was done in 18 patients for small cyst after ultrasound guided bracketing.

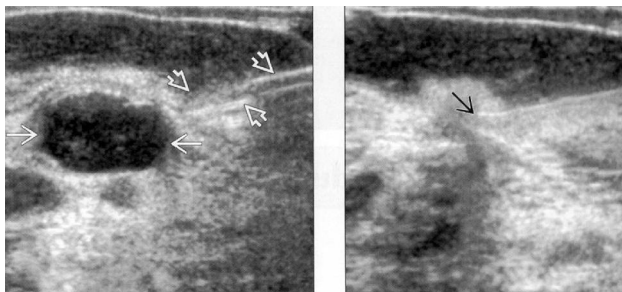


Figure 1: Sonoguided aspiration of complicated breast cyst

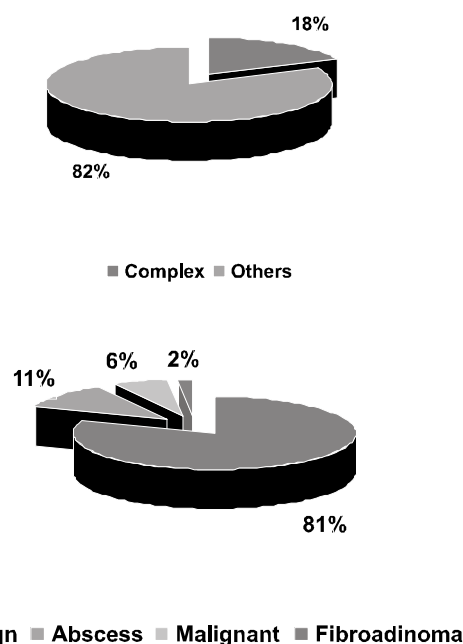
Results

From 350 ultrasound guided interventions 62 procedures were performed for complex breast cysts in 54 patients.

Out of these 50 (86%) lesions were characterized as thin walled cysts with internal echoes and thin septations. Septal thickness was < 3mm. None proved malignant on cytology.

Of the remaining lesions, 7 (11.3%) were thick walled cysts with thick internal septations >5mm. On histopathology 1 was infected galactocoele and 6 were breast abscesses. 5 lesions were solid cum cystic masses with cystic predominance, 4 (6%) of these were malignant, and one was fibroadenoma with cystic change.

In malignant lesions three were invasive ductal carcinomas grade 3 and 1 was lobular carcinoma.



Discussion

Breast cysts are extremely common and can be found in most women more than 40 years old.^{4,7,8} The accuracy of sonography in detecting and allowing correct diagnosis of cyst has been reported to be almost 100%.^{9,4,10} With standard linear array high frequency transducer depending upon the sonological criteria simple cyst can be easily differentiated from the complex one.^{3,5,11}

At US, breast cysts are categorized as simple, complicated, or complex.^{1,4,5} Appropriate categorization is important because the management of each type differs.

Simple cysts are defined as anechoic, well-circumscribed, round or ovoid masses with an

imperceptible wall and increased through-transmission of sound waves.¹² Complicated cysts contain low-level internal echoes or intracystic debris that may layer and shift with changes in patient position. The homogeneous internal echoes within some complicated cysts may produce an appearance identical to that of a circumscribed solid mass. Complicated cysts do not contain thick walls, thick septa, or other discrete solid-appearing components. The risk of malignancy among complicated breast cysts is less than 2%.^{4,6} these cysts generally can be managed with short-interval follow-up imaging or aspiration. However, if a complicated cyst is symptomatic, new, or enlarging, needle aspiration is indicated.

Complex breast cysts are defined as cysts with thick walls, thick septa, intracystic masses, or other discrete solid components.⁴ By using criteria adapted from Berg et al⁴, we can categorize complex cystic breast masses into four classes on the basis of their US features: Type 1 masses have a thick outer wall, thick internal septa, or both; type 2 masses contain one or more intracystic masses; type 3 masses contain mixed cystic and solid components and are at least 50% cystic; and type 4 masses are predominantly (at least 50%) solid with eccentric cystic foci. The need for justifiable criteria that can be used to treat patients with complex cysts is emphasized by the increasing number of complex cysts detected, in part because technologic advances and improvements in sonography equipment are now more capable of detecting echoes within cysts.^{3,6}

Literature review revealed that only small number of studies have examined complex breast cysts and quantified the associated cancer detection rate. In study done by Venta1999 et al³ only one (0.3%) of 308 complicated cyst proved to be malignant which was 3mm focus of DCIS diagnosed at CNB. Buchburger et al 2003⁴ found no malignancy in 133 complicated cysts while 7 out of 38 complex cystic masses proved to be malignant. Kolb et al⁹ found none of 126 thin wall cysts with internal echoes malignant in their series of screening sonography.

Similarly in our study 50 thin wall cyst with fine echoes proved to be benign while out of 12 solid cum cystic masses 4 proved to be malignant.

Therefore, we believe that complicated cyst with thin wall and low-level internal echoes and septal thickness less than 3mm are mostly benign and need short term follow up. This treatment strategy would decrease the cost of and the patient anxiety associated with

interventional procedures. However, Complex cystic masses with thick indistinct wall and thick septation or solid cum cystic masses with eccentric cystic foci should be biopsied.

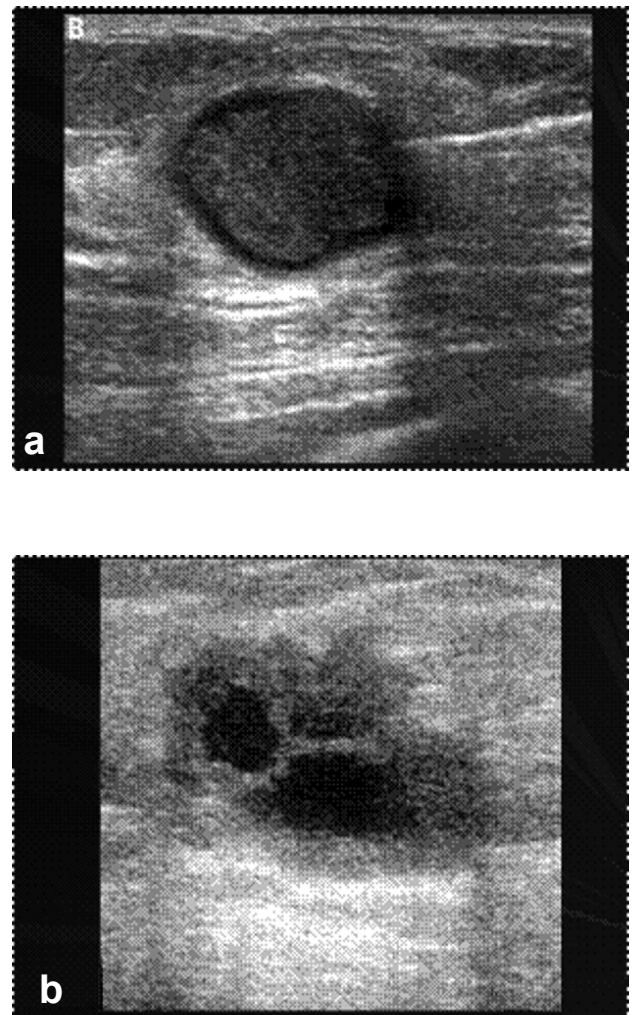


Figure 2: (a) Transverse scan of breast showing complicated cyst with dense internal echoes (b) complex cyst showing thick wall with thick internal septation

Conclusion

Complicated cyst with thin wall and low-level internal echoes and septal thickness less than 3mm are mostly benign and need short term follow up.

Complex cystic masses with thick indistinct wall and thick septation or solid cum cystic masses with eccentric cystic foci should be biopsied.

- The use of sonography reduced the number of biopsies performed for benign breast cyst
- In study done by Venta¹⁹⁹⁹ et al³ only one (0.3%) of 308 complicated cyst proved to be malignant which was 3mm focus of DCIS diagnosed at CNB
- Buchburger et al 2003 found no malignancy in 133 complicated cysts while 7 out of 38 complex cystic masses proved to be malignant
- Kolb et al⁶ found none of 126 thin wall cyst with internal echoes malignant in their series of screening sonography.
- In our study 50 thin wall cyst with fine echoes proved to be benign while out of 12 solid cum cystic masses 4 proved to be malignant

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