

COMPLEX BREAST CYSTS: SONOGRAPHIC FINDINGS AND HISTOPATHOLOGIC RESULTS

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KOMPLEKS MEME KİSTLERİNDE ULTRASONOGRAFİ BULGULARI VE HISTOPATOLOJİ SONUÇLARI

ÖZET

Amaç:Bölümümüzde saptanan ve ultrasonografi kılavuzluğunda kesici iğne biyopsisi ya da işaretli eksizyonel biyopsi yapılan kompleks meme kistlerinde ultrason bulgularını ve histopatoloji sonuçlarını gözden geçirmek. Kesici iğne biyopsisi ile tanı alan olgularda kesici iğne biyopsisinin tanısal güvenilirliğini değerlendirmek.

Hastalar ve Yöntem:Bölümümüzün meme görüntüleme ünitesi arşivinden son 10 yılda ultrasonografi incelemesinde memesinde kompleks kist saptanan ve biyopsi yapılan 61 olgu değerlendirildi. Kalın duvarlı-kalın septalı kistler ve solid bileşen içeren kistler çalışmaya dahil edildi. Hem kistik, hem de solid odak içeren karma tip lezyonlar çalışma dışı tutuldu. Tüm lezyonların ultrasonografi ve varsa mamografi bulguları gözden geçirildi. Histopatoloji sonuçlarıyla karşılaştırıldı.

Bulgular:Toplam 61 kompleks meme kistinin 39'unda (%64) kalın duvar/kalın septa, 22'sinde (%36) solid bileşen vardı. Histopatolojik değerlendirme sonucunda 61 lezyonun 48'i benign (%79), 13'ü (%21) malign tanı aldı. Otuzdokuz kalın duvarlı/kalın septalı kompleks kistin 31'i (%79) benign, 8'i (%21) malign tanı aldı. Toplam 22 solid bileşenli kompleks kistin 17'si (%77) benign, 5'i (%23) malign tanı aldı.

Sonuç:Kompleks meme kistleri basit meme kistlerinden farklı olarak malignite riski taşıyan, biyopsi gerektiren lezyonlardır. Bizim çalışmamızda kompleks meme kistlerinin %21'inde malignite saptandı. Kesici iğne biyopsisi bu lezyonlarda güvenilir histopatolojik tanı sağlamaktadır. Ancak, klinik-radyoloji-patoloji uyumsuzluğu olan olgularda, hücresel atipi varlığında eksizyonel biyopsi gereklidir.

Anahtar sözcükler: meme ultrasonografisi, kompleks kist, meme

ABSTRACT

Purpose: To evaluate the sonographic findings and histopathological diagnosis of complex breast cysts, and to assess the diagnostic reliability of a 14G core-needle biopsy.

Patients and Methods: Sixty-one complex breast cysts that underwent a 14 G core-needle biopsy and/or surgical excisions were retrospectively analyzed. Cystic masses with thick wall- thick septation and with solid component were included. Mixed lesions with both cystic and solid appearance were excluded. Radiologic findings and histopathologic diagnosis of these lesions reviewed retrospectively.

Results: Of 61 lesions, 39 (64%) were complex cysts with thick wall and/or thick septation and 22 (36%) were complex cysts with solid component. Forty-eight (79%) lesions were diagnosed as benign and 13 (21%) lesions were diagnosed as malignant. Of the 39 complex cysts with thick wall-thick septation, 31 (79%) lesions were diagnosed as benign and 8 (21%) lesions were malignant. Of the 22 complex cysts with solid component, 17 (77%) lesions were diagnosed as benign and 5 (23%) were malignant.

Conclusion: Complex breast cysts have malignancy risk and usually require biopsy. Thirteen of 61 (21%) complex cysts proved malignant in our study. Core needle biopsy is a safe and reliable diagnostic procedure in the management of these cases. However, in cases of clinical/radiological/pathological discordance or the presence of atypical cells, a surgical excision should be performed.

Keywords: breast sonography, complex cyst, breast

Introduction

Ultrasonography is a reliable diagnostic tool for differentiation of solid and cystic breast masses. It also contributes differentiation of breast masses as benign or malignant. Ultrasonography An ultrasound is appropriate for evaluation breast diseases in young women and also adjunctive evaluation of mammographic abnormalities. Bilateral whole breast ultrasounds are a complementary examination of mammography, especially in women with a dense breast (1).

In women with a palpable abnormality, have a mass lesion with mammography, or if a simple breast cyst is present; it is considered benign and does not require intervention. Painful cysts can be aspirated for symptom relief. An ultrasound is a useful guide for needle aspiration, and for abscess drainage. If a complex cystic mass is determined with an ultrasound, clinical and radiologic management is different from management of simple cysts. Complex breast cysts are suspicious lesions for malignancy and usually need biopsy (2,3).



Figure 1. Grey-scale ultrasound shows complex cyst with thick wall. After core-needle biopsy histopathologic diagnosis was abscess.

An ultrasound-guided core-needle biopsy is widely used for diagnosis of breast masses. It is a relatively cheap, minimally invasive tool which obtains appropriate histopathologic diagnosis. The aim of this study is to review sonographic and histopathologic findings of complex breast masses which were diagnosed in our department within the last 10 years and to evaluate the cases which were diagnosed with core-needle biopsy.

Material and methods

Our study is a retrospective review, in which data was obtained from the clinic, radiology and pathology archives of our institution. No ethical committee application was done.

The medical records of patients who had complex breast cysts and underwent breast biopsy at our institution (14G core-needle biopsy or excisional biopsy) between 2000 and 2010 were retrospectively analyzed. Radiological (ultrasound and if present, mammography) findings of 61 lesions in 60 women patients with the final diagnosis of complex breast masses were re-evaluated. Mammograms and ultrasound images of these patients were re-examined by 2 radiologists who were experienced in breast imaging. Histopathologic results of all patients were recorded. Complex cysts features were determined according to criterion of Berg et al: If cyst wall or septa thickens more than 0.5 mm, accept as a complex cyst (4) (Figure 1, 2, 3). In addition, cysts which have solid components of less than 50% of the mass were included (Figure 5, 6, 7). Cysts with solid components of more than 50% of the mass, mixed tumors with both solid and cystic components, and solid masses with eccentric cystic foci were excluded because these lesions were not defined as primarily cystic mass.

On sonographic examination, lesion size, contour properties, presence of thick indistinct walls and thick septations (≥ 0.5 mm), presence of solid component were evaluated and recorded. If present, findings of mammographic examination were evaluated. Lesion size, density, contour properties, and presence of microcal-

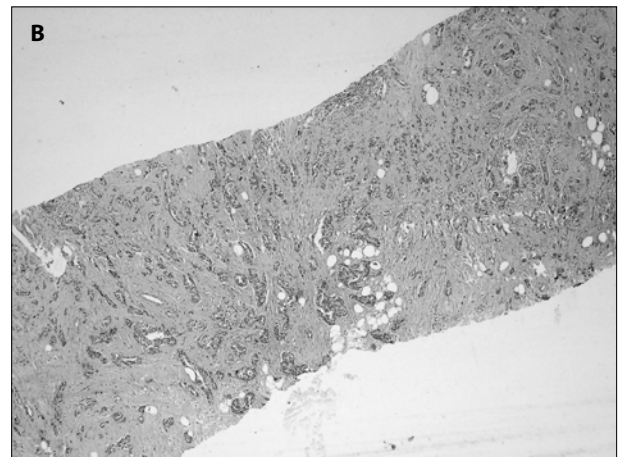
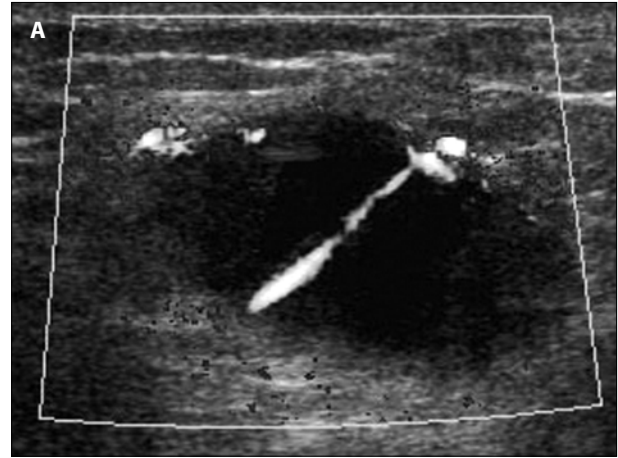


Figure 2A,B. Color Doppler ultrasound shows vascularity within a complex cyst with thick wall and thick septations (A). After core-needle biopsy, diagnosis was invasive ductal carcinoma, hematoxylin-eosin stain x40 (B)

cifications were evaluated and recorded. If present, type of microcalcifications was defined.

Craniocaudal and mediolateral oblique mammograms of both breasts were obtained with the Mammoray 4000 (Phillips Medical Systems, Eindhoven, Netherlands). Spot compression films, lateral or medial projections were also obtained, when needed. Ultrasonography examinations were done with a 7.5 MHz linear array transducer mounted on EUB 420 (Hitachi Medical Systems, Tokyo, Japan), with 6-12 MHz broadband transducer mounted on Aplio 80 (Toshiba Medical Systems, Otawara, Japan), and with 6-13 MHz broadband transducer mounted on Acuson Antares (Siemens, Mountain View, CA, ABD) ultrasonography units.

All core-needle biopsies were done with 14G core-needle by an automated biopsy gun (Bard Magnum, Covington, GA).

Results

The average age of the 60 women was 45 ± 8 years old (age range:19-81). Nineteen (31%) lesions were palpable, and 43 le-

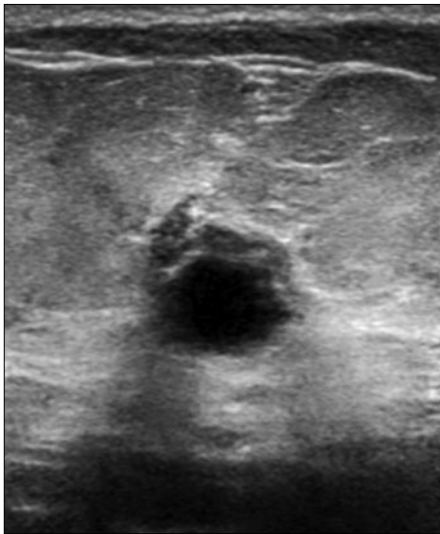


Figure 3. Grey-scale ultrasound shows complex cyst with thick anterior wall and solid component. After core-needle biopsy histopathologic diagnosis was fibrocystic changes.

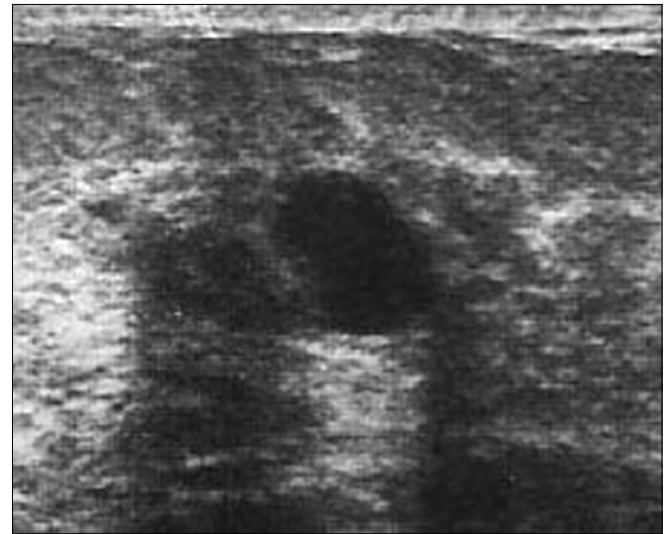


Figure 4. Grey-scale ultrasound shows complex cyst with solid component. After core-needle biopsy diagnosis was ductal carcinoma in situ. Surgical excision with wire localization confirmed diagnosis.

sions (69%) were non-palpable on physical examination. Average lesion diameter was 16 ± 8 mm (4 mm-42 mm).

Thirty-nine (64%) lesions were with thick wall/thick septations, and 22 (36%) lesions were with solid component. Of the 39 complex cysts with thick wall/thick septations, 21 lesions were well-defined margins, 10 were lobulated, and 8 were ill-defined margins. Of the 22 complex cysts with solid component, 12 lesions were well-defined margins, 4 were lobulated, and 6 were ill-defined margins. Mammographic examination was done in 41 women. Of the 41 lesions on mammography, 21 were well-defined margins, 6 were lobulated, and 10 were ill-defined margins. In one case, uniform cluster of microcalcifications in a well-defined mass lesion with 1 cm diameter; in two cases, scattered and slightly pleomorphic

microcalcifications in lobulated masses were shown by mammographic examination. All the cases have microcalcifications diagnosed as benign (mammography and sonography findings were summarized in Table 1).

Of the 61 lesions, 48 (79%) were diagnosed as benign, 13 (21%) were malignant on histopathologic examination. Of the 39 complex cysts with thick wall/thick septations, 31 (79%) were benign

Table 1. Lesion distribution according to radiological findings

Lesion Features	Mammography	Ultrasonography
Well-circumscribed mass	21	31
Lobulated mass	6	13
Ill-defined mass	10	13
Architectural distortion+ well-circumscribed mass	1	1
Lobulated mass + microcalcifications (scattered)	2	2
well-circumscribed mass + microcalcifications (clustered)	1	1
TOTAL	41	61

Table 2. Lesion distribution according to histopathologic diagnosis

Sonographic finding (number)	Histopathologic Diagnosis (number)	
	Benign (48)	Malignant (13)
Thick wall/thick septations (39)	Abscess (10)	
	FCC ¹ (8)	
	Cystic c. + apocrine mp ² (5)	
	Fat necrosis (2)	DCIS ⁴ (2)
	Periductal mastitis (2)	IDK ⁵ (6)
	ADH ³ (1)	
	Intraductal papilloma (1)	
	Galactocel (1)	
	Intraductal papilloma (5)	
	FCC (4)	
Solid component (22)	Cystic c. + apocrine mp (2)	
	Atipik Intraductal papilloma (1)	DCIS (2)
	Fibroadenoma (1)	IDK (3)
	Abscess (1)	
	ADH (1)	
	Periductal mastitis (1)	
	Fat necrosis (1)	

1: Fibrocystic changes (fibrosis, sclerosing adenosis, apocrine metaplasia)

2: Cystic changes + apocrine metaplasia

3: Atypical ductal hyperplasia, 4: Ductal carcinoma in situ, 5: Invasive ductal cancer

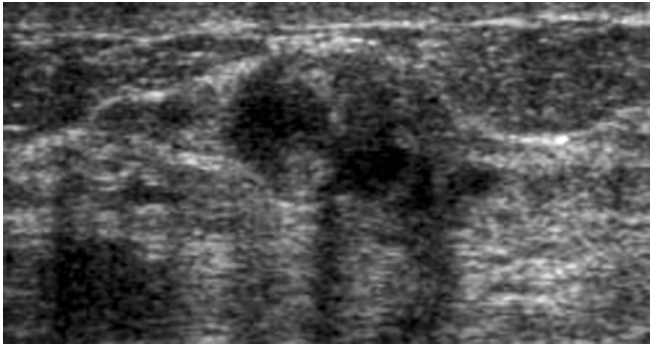


Figure 5. Grey-scale ultrasound shows complex cyst with solid component. Histopathologic diagnosis after core-needle biopsy was atypical ductal hyperplasia. After surgical excision with wire localization final diagnosis was changed: ductal carcinoma in situ.

and 8 (21%) were malignant. Of the 22 complex cysts with solid component, 17 (77%) were benign and 5 (23%) were malignant (distribution of the lesions according to histopathologic examination was summarized in Table 2).

Forty-seven lesions were diagnosed by ultrasonography-guided 14G core-needle biopsy, 14 lesions were undergone surgical excision with wire-needle localization (biopsy type of the lesions summarized in Table 3). In core-needle biopsy cases, the average sample number was 4.

Surgical biopsy with wire-needle localization was performed to obtain sufficient material for an accurate diagnosis. Indications of surgical biopsy were small lesions and papillary lesions located within a cyst or ducts. Six lesions had radiologic-pathologic discordance or cellular atypia after core-needle biopsy were undergone surgical biopsy. In one case, which was diagnosed as fibrocystic changes and sclerosing adenosis with core-needle biopsy, underwent surgical biopsy because of radiologic-pathologic discordance. Final diagnosis was not changed. The other case that was diagnosed as atypical intraductal papilloma underwent surgical biopsy and the final diagnosis remained the same.

Two cases were diagnosed as atypical ductal hyperplasia (ADH), and two cases with ductal carcinoma in situ (DCIS) underwent surgical biopsy. After surgical biopsy, final diagnosis was DCIS

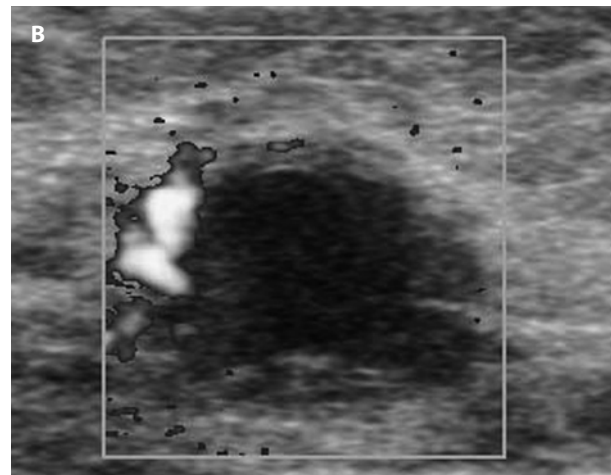
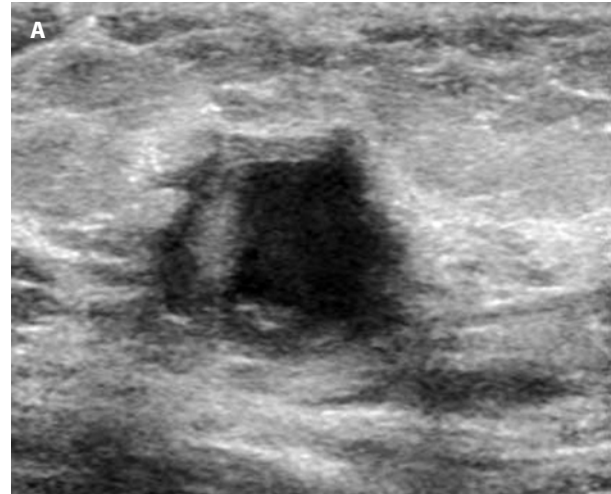


Figure 6 A,B. Grey-scale (A) and color Doppler (B) ultrasonography show vascularity of complex cyst with thick-irregular wall and solid component. After core-needle biopsy diagnosis was ductal carcinoma in situ. After surgical excision, diagnosis was confirmed.

in one ADH case; and there was no diagnostic alteration in the second one. One case was diagnosed as DCIS after core-needle biopsy and undergone surgical excision but final diagnosis was not change. Out of 9 invasive ductal cancer (IDC) cases, one was diagnosed with surgical excision; others were diagnosed with core-needle biopsy. No alteration suggesting malignancy was

Table 3. Lesion distribution according to biopsy type

Sonographic finding (number / percent)	Biopsy type (number)		Histopathologic diagnosis (number)	
	*CNB	SE	Benign	Malignant
Thick wall/thick septations (39/64)	(32)	(6)	(31)	(8)
Solid component (22/36)	(15)	(8)	(17)	(5)
TOTAL	47	14	43	13

*CNB: Core-needle biopsy, SE: Surgical excision with wire localization

noted during the follow-up examinations of core-needle biopsy patients. False negative rate of core-needle biopsy was 1.9%.

Discussion

Ultrasonography is a reliable diagnostic tool for differentiation of solid and cystic breast masses of the women with breast masses. During ultrasonography, simple cysts are defined as round or ovoid, well-circumscribed masses with an imperceptible wall and increased through-transmission of sound waves (posterior acoustic enhancement). Simple breast cysts do not need further examination, follow-up, or intervention. Painful simple breast cyst can be aspirated for symptomatic relief. When the cyst fluid is bloody, cytopathologic examination is indicated. At ultrasonography, complicated cysts contain low-level internal echoes, diffuse homogenous internal echo, and thin septations. The risk of malignancy among complicated cysts is less than 2%. Symptomatic complicated cysts can be aspirated for symptomatic relief. When the cyst fluid is purulent, microbiologic examination is indicated. Complicated cysts generally can be managed with short-interval follow-up imaging (1-5).

Complex breast cysts are defined as cysts with thick walls, thick septa, and discrete solid components. During the ultrasonographic evaluation of complex cysts, tissue harmonic imaging, and spatial compounding facilitate better visualization and better characterization of lesion. These tools are particularly helpful in decreasing artifacts and improving signal to noise ratio; lesion characteristics like contour properties and internal structures can be define more detailed and more accurate (6-7). Doppler ultrasonography helps to detect vascularity in wall, septations or solid component of complex cysts and provides accurate definition of debris or solid mass. Complex breast cysts have a substantial chance of being malignant. Malignancy was reported in 23% and 31% of cases in two series in literature (2). On ultrasonography examination, thick wall, thick septations, and solid component can be seen in both benign and malignant lesions.

In our study, most frequent benign lesions were abscess, fibrocystic changes, intraductal papillomas and simple cystic changes with apocrine metaplasia. Lesions with cellular atypia were atypical ductal hyperplasia and atypical intraductal papilloma.

Malignant lesions were DCIS and invasive ductal carcinoma. Of 9 invasive ductal carcinomas, one was tubular, and one was medullar type. In this study, 21% of complex cysts were malignant. Comparing with literature, malignancy rate of our study was less than other studies. We excluded the complex cysts with large solid components and mixed lesions with eccentric cystic foci. We believe that this difference from other studies was the reason of having less malignancy rate.

Core-needle biopsy is a cost-effective and minimally invasive biopsy method for diagnosis of breast masses. It is widely used and good alternative of surgical biopsy. Today, core-needle biopsy is the current method for histopathologic diagnosis of breast lesions before surgical intervention. In current literature, false negative rate of core-needle biopsy is 0.3-3.2% (mean 2.8%) (8, 9). In our study, false negative rate of core-needle biopsy was 1.9%.

Core-needle biopsy provides sufficient samples in solid masses. If a complex cyst contains small solid component, it can be possible to have inadequate sampling with a core-needle biopsy.

Intracystic or intraductal papillary lesions also can be detected as complex cystic lesion. If solid component is small in both intracystic papillary lesions and in complex cysts, inadequate sampling is a potential problem. Surgical excision is a reliable alternative for accurate diagnosis in these lesions (10). In some cases, decompression of the cystic component may make it more difficult to target and sample it. Because of this problem, we perform a core-needle biopsy without fluid aspiration. Placement of a clip at the time of ultrasonography-guided biopsy especially in small lesions will facilitate subsequent identification of the lesion if excision required (11).

Management of breast lesions is determined according to the collective decision by the multi-disciplinary meetings with the participation of the surgery, pathology, and radiology departments in our institution. Our method of approach for diagnosis of complex breast cysts is core-needle biopsy at first. If there is a clinic-radiologic-pathologic discordance or cellular atypia after core-needle biopsy, surgical excision should be the next step to complete the evaluation (12).

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