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An atypical breast lesion: bilateral multiple myoid hamartoma

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A 41-year-old female presented at the department of radiology because of multiple slowly growing lumps in both breasts. Mammography showed dense breast tissue with multiple well-circumscribed round lesions with no calcification. At ultrasound, sharply defined, heterogeneous oval masses were seen. On T2-Weighted Images (WI), the lesions were heterogeneous and hyperintense. T1-WI after intravenous administration of gadolinium contrast showed multiple rapidly and strongly enhancing lesions with type 2 to 3 curves (plateau and wash-out curve). Core needle biopsy reported bilateral multiple myoid hamartoma.

Hamartoma of the breast is a benign proliferation of fibrous, glandular, and fatty tissue surrounded by a thin capsule of connective tissue. Breast hamartomas consist of approximately 0.7-5% of all benign breast tumors. The majority of these lesions occur in women over 35 years of age. The myoid or the muscular variant, Myoid Breast Hamartoma (MBH) is exceptionally rare with less than 30 reported cases in the English medical literature.

The clinical, radiological and pathological features are discussed. The differential diagnosis includes other benign (e.g. multiple fibroadenomas, leiomyomas) and malignant breast lesions (e.g. leiomyosarcomas). A core biopsy is usually diagnostic for a myoid hamartoma, although excision and subsequent immunohistochemical examination is mandatory for definite diagnosis of this rare lesion.

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Do non specific minimal signs in a biennial mammographic breast cancer screening programme need further diagnostic assessment?

R.M. Maes¹

This article is the inspiration for a presentation on a meeting of the Section Senology RBRS on 7/6/2011 by M. Mortier and P. De Visschere, U GENT.

Definition Minimal Signs (MS) in accordance to BIRADS 4th ed.:

- Asymmetry
- Global asymmetry
- Focal asymmetry
- Microcalcifications with low suspicion
- Masses, round or oval, sharply circumscribed, slightly lobular
- Parenchymal distortion

Frequency minimal signs in screening: +/- 10%.

Definition of probably benign: "lesions that carry a less than 2% likelihood of malignancy (lesions for which at least 50 biopsies are needed to identify 1 cancer)" (JWL Leung, *Radiol Clinics North Am* (2007) 45: 773-789).

A developing mammographic sign, when compared with previous films, cannot be interpreted as MS. When developing the likelihood of malignancy is sufficiently high to justify recall and if necessary biopsy. In these cases, normal sonographic findings do not exclude malignancy.

Risk False Negative (Sickles. *Radiology* (1991) 179: 463-468): Periodic mammographic follow-up of probably benign lesions: results in 3184 consecutive cases: 17 malignant = PPV 0.5%.

Characteristics of missed cancers in screening mammography:

- unfulfilled strict probably benign criteria
- under- or overexposed films
- image unsharpness, motion artifacts
- inadequate positioning: lesion not on the film
- inadequate compression
- artifacts
- lesion on the edge of the film: prepectoral, inframammary fold, retroareolar

Conclusion

The additional risk to that of screened women in general when a minimal sign is present is + 0.5%. When mammography analysis is done correctly and the criteria of probably benign are strictly fulfilled the advice of R. Maes is to invite those women for the next screening round in 2 years.

Intracystic papilloma of the breast

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Background

A 53-year-old woman (1) and a 47-year-old woman (2) presented for work-up of a painless large breast mass. They both had no significant personal or family history. The mass of the second patient showed distinct progressive growth.

Mammography was performed for the first patient (impossible for the second patient due to the extent of the mass) and ultrasound was performed on both patients, as well as additional MRI for the first patient, and CT-scan for the second.

Work-up

Mammography showed multiple large cysts in the left breast in patient 1. Ultrasound depicted these cystic lesions and showed additional intracystic solid wall proliferations in both women. An MRI examination in the first patient confirmed the large cysts with solid wall components with contrast enhancement of the solid lesions. Since this image was suspect for malignancy, additional fine needle aspiration cytology (FNAC) was performed. A CT-scan performed on the second patient was better able to depict the extent of the mass and its relation to the chest. FNAC of the cystic mass was performed in both patients.

Radiological diagnosis

Based on the radiological (mainly ultrasound and MRI) and cytological findings, diagnosis of intracystic papilloma was made.

Discussion

An intracystic papilloma (ICP) is a benign papillary lesion supported by a fibrovascular stalk, growing inside an apparent cystically dilated duct. It may occur at any age but is most commonly seen between 30 and 55 years.

It is very difficult to distinguish radiographically between ICP and intracystic papillary carcinoma (ICPC). ICP more often forms a single nodule protruding intracystically, while ICPC usually is larger (> 3 cm) and forms multiple aggregate nodules or even almost solid tumors with a small cystic part. Despite these guidelines, intracystic papillary lesions may be impossible to differentiate. The kinetic features for contrast enhancement on MRI are not helpful either since both the benign and malignant papillary lesions exhibit fast, strong, early enhancement and washout or a plateau enhancement pattern.

Therefore, FNAC should be performed on all cystic breast masses with internal

solid wall proliferations. To start, it can help differentiate between intracystic debris and true solid components. And second, cytologic examination can help evaluate for malignant cells suggestive of ICPC. However, even FNAC as well as core biopsy with pathology of a intracystic papillary lesion can be misleading because cellular atypia is slight in the majority of ICPC's.

For this reason and because several studies have shown that a substantial number of lesions are upgraded in diagnosis at excision, all intracystic papillary lesions diagnosed by either imaging or cytology, should be excised surgically

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Unusual breast metastasis

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Metastatic malignancy in the breast is unusual, especially metastatic spread from extramammary primary tumors. We report a rare case of metastasis to the breast from a renal cell carcinoma.

Case presentation

A 71-year-old woman consulting for a routine breast cancer screening, with no history of breast cancer, presented with an asymmetric palpation of the upper left quadrants. The mammogram, ultrasound and magnetic resonance imaging suggested a malignant mass at the junction of the upper left quadrants. An ultrasonography-guided core biopsy was taken to assess the nature of the lesion. The histopathological examination and immunohistochemical tests showed it to be a metastasis from a renal cell carcinoma. Consecutive computed tomography of the abdomen confirmed the renal origin of the metastasis. Palliative treatment was recommended based on a multidisciplinary assessment.

Conclusion

Breast metastases are uncommon but are not to be disregarded as their finding might reveal an aggressive underlying primary tumor. Imaging and histopathology are complementary in diagnosing the disease and evaluating its spread.

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Diagnostic accuracy of core biopsy and vacuum assisted biopsy in case of atypical hyperplasia of the breast

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Long term follow-up of patients initially diagnosed with atypical hyperplasia of the breast (a collective noun that includes atypical ductal hyperplasia, flat epithelial atypia, atypical lobular hyperplasia and lobular carcinoma in situ) has shown us that it has an increased risk of malignant degeneration. Through improved imaging techniques, organization of breast cancer screening programs and the increasing use of advanced biopsy techniques such as vacuum assisted biopsy, atypical hyperplasia has been diagnosed more and more frequently during recent years.

Results of follow-up surgical excision have shown us that core biopsy (CNB) and vacuum assisted biopsy (VAB) are associated with a certain underestimation rate in case of atypical hyperplasia. The purpose of this study was therefore to evaluate the accuracy and diagnostic value of today's most frequently used biopsy techniques in case of atypical hyperplasia in order to ensure a proper indication for surgical excision.

Materials and methods

We searched the Pubmed database for following terms: 'atypical hyperplasia', 'atypical ductal hyperplasia', 'flat epithelial atypia', 'atypical lobular hyperplasia', 'lobular carcinoma in situ', 'breast', 'core biopsy', 'vacuum assisted' for the period 2001-2010. We selected publication that compared the results of CNB/VAB with those of surgical excision. Publications with mixed or synchronous pathology were excluded.

Results and discussion

45 publications were selected, representing 176 241 biopsies. The mean prevalence of atypical hyperplasia was 2,2% (ADH 3,6%; ALH/LCIS 0,86%; FEA/FEA+ADH 1,7%). The frequency where the CNB/VAB result was an underestimation of the result of surgical excision (malignancy) was expressed as a percentage (the underestimation ratio or upgrade ratio 'UR'). We mention four major findings. First, ADH seems to be more frequently underestimated (UR 1/3) than lobular neoplasia (LN = ALH+LCIS) and FEA/FEA+ADH (UR 1/5). Secondly, switching from CNB to VAB in case of atypical hyperplasia implies a reduction of the UR of about 50% (for example for ADH from 43% to 23%). This is probably due to the fact that VAB is able to obtain more and larger tissue fragments, that it uses a single insertion technique and that it is frequently associated with the use of stereotaxis (cfr. infra). Thirdly, needle diameter plays an important role; 11 Gauge needles have an UR that is 5 to 10% lower than the UR of 14 Gauge needles. UR's of larger needle diameters were probably less reliable because of the limited number of biopsies performed with these diameters. Finally, stereotaxis

seems to be a much more reliable technique than ultrasound (UR 24% and 42% respectively), though this is probably due to the fact that ultrasound is still often used together with CNB, which has an inherently higher UR (cfr. supra). The fact that MRI has a relatively low accuracy (45%) is likely due to the limited number of publications and limited experience. Furthermore, age (> 50 years) and a mass on imaging were two predictive factors of underlying malignancy.

Conclusion

In case of atypical hyperplasia, ADH is associated with the greatest underestimation ratio (1/3). LN and FEA are underestimated less frequently (1/5). A relatively large needle diameter (11G) is essential for correct diagnosis, as well as a sufficient number of tissue fragments (at least 5). VAB ensures a reduction of the underestimation rate of about 50% compared to CNB. Stereotaxis seems to be more precise than ultrasound. These new imaging and biopsy methods thus imply an important improvement in diagnosis. However, underestimation rates of CNB and VAB in case of atypical hyperplasia are still significantly high, making wider surgical excision recommended, irrespective of the used localization technique and needle diameter.

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Osmotic exchanges through the membrane of a silicone breast implant: an unusual complication

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A 25-year-old woman is addressed for a breast ultrasound. Ten months ago, she had been operated for a bilateral breast augmentation. Two Eurosilicone gel-filled breast implants were inserted in retropectoral position. The patient had no relevant previous medical history and no risk factor of breast cancer.

The clinical examination reveals a painful increased of volume of the left breast.

The ultrasound demonstrates an echoic liquid surrounding the left breast implant. No sign of breast implant rupture is observed.

A fine needle aspiration of peri-prosthetic liquid is performed under ultrasound guidance. The cultures of the liquid are negatives. The cytological analysis shows histiocytes with cytoplasmic vacuoles of silicone.

The patient has been operated in another hospital and her surgeon confirms the absence of breast implant rupture. Thus, we conclude to a phenomenon of osmosis through the membrane of the left breast implant.

Discussion

The osmotic exchange through the "semi-permeable" membrane of a silicone breast implant is an unusual

complication (1). The diagnosis is based on the cytological analysis of the peri-prosthetic liquid showing a silicone leakage. Moreover, no sign of breast implant rupture is observed.

Magnetic resonance is the more sensitive exam for the detection of a breast implant rupture (2). In our case, the surgeon has decided to perform a surgical revision of the implant in order to formally exclude a rupture. In this situation, other colleagues propose some repeated fine needle aspirations of the peri-prosthetic liquid associated with a non-steroidal anti-inflammatory drug. However, the optimal management of this unusual complication remains unclear.

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The risks of radiation therapy of breast cancer

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Radiation therapy of breast cancer can, in very rare cases, imply some oncologic consequences.

We introduce two women with a slightly different presentation of the same radiation induced oncologic pathology. Both women had a broad excision of an intraductal adenocarcinoma (IDA) of the breast with axillary clearance within ten years from now. They both received radiation therapy (25 x 2 Gy) with a radiation boost (16 Gy) of the tumor bed.

Our first patient, with a history of IDA of the right breast, presents with a one week lasting sensitive areola, and an induration felt at 5 o'clock, in the right breast. An ultrasound only reveals some postoperative sequelae, and additional biopsy shows no abnormalities. 5 months later, due to persisting pain, with a swollen breast, and a retracted nipple, an MRI of the breasts is performed. In the right breast, two lesions with rapid rim enhancement are visualised, and more caudally there are two zones of contrast captation without clear delineation. Mammography reveals no specificities. A repeated ultrasound shows expansive hyperreflective nodular zones with a hyporeflexive border. Biopsy of these zones is performed.

Our second patient, with a history of IDA of the left breast, complains of a red,

painful left breast, which feels warm, and is edematous. To confirm this clinical presentation of peau d'orange, an MRI of the breasts is performed. This shows pathological strong enhancement of the left nipple and areola, as well as a strongly enhancing zone retroareolarly, expanding a few cm posteriorly. A difficult differential diagnosis remains after this examination: inflammatory disease or tumoral pathology, and an ultrasound with puncture is performed. The ultrasound is suggestive of inflammatory changes and the following biopsy shows benign findings compatible with fibrosis. Clinical symptoms remain the same, and two months later the ultrasound is repeated. The imaging findings are now slightly different: a heterogeneous hyporeflexive zone retro-areolarly and laterally, and within this zone a small hyporeflexive nodular structure with prominent peripheral vascularisation. The biopsy is repeated.

Biopsy in the two patients reveals the same pathology: a radiation induced angiosarcoma. Both our patients were treated with a mastectomy.

Radiation Induced Angiosarcoma is a high grade tumor with an aggressive nature.

The diagnostic criteria include previous radiotherapy with a latency of several years (5 or more), development of sarcoma within a previously irradiated field, and a histologic confirmation.

The radiation dose, responsible for the development of this type of angiosarcoma, lies within the total range of 40-50 Gy. It is a very rare pathology, with an incidence of 0.05-0.2%, and the average latency period is 12.5 years.

Presentation is as a (sub-)cutaneous, painless lesion, flat or nodular, and with a (pathognomonic) bluish or purplish aspect. Hence, differentiation from a benign angioma, or teleangiectasis is sometimes difficult.

Diagnosis of this pathology brings some serious challenges as well, first of all due to its rarity. In addition, it has a benign appearance, and is also difficult to differentiate from radio-induced changes. Mammography plays no important role in diagnosis, due to the very aspecific findings, nor does ultrasound. Core needle biopsy with pathologic confirmation is central in the diagnosis.

Treatment is never conservative, but consists of mastectomy.

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An uncommon rapid growing breast tumor: phyllodes tumor

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We found a rapid growing breast tumor in follow-up of an earlier histologically proven benign small atypical breast tumor suggestive for sclerosed fibroadenoma. Since the small sample size and suspect type 3 kinetic curve on a breast MRI from another hospital we suggested follow up after six months however histology showed no malignant cells. Follow up mammography showed an enlarged lobulated well-circumscribed nodule with heterogeneous density medial in the left breast. A septated heterogeneous mass was seen on sonography with solid and cystic components. Solid components were vascularized as seen on color Doppler imaging. MRI showed on inversion recovery T2-weighted imaging (WI) a heterogeneous mass with overall hyperintense signal intensity with hypointense areas and hypointense septa. The maximum diameter was 3.5 cm versus 2 cm on first sonography. On dynamic contrast enhanced T1-WI the mass showed a marked inhomogeneous enhancement. Kinetic curves displayed a quick intensity rise with wash-out. Because of these malignant characteristics we categorized the mass BI-RADS 4c. Core biopsies were compatible with benign phyllodes tumor. The tumor was surgically removed and histopathology showed a borderline phyllodes tumor.

Phyllodes tumor represents less than 1% of all breast tumors. The peak incidence is between 35 and 55 years. The tumor has characteristic leaf-like stromal projections in cystic cavities. The malignancy grade is categorized as benign, borderline or malignant based on tumor margins, stromal cellularity and overgrowth, stromal cell atypia and mitotic activity.

Patients typically present with a painless rapid growing breast mass for which imaging is requested.

Mammography shows an aspecific well-circumscribed mass. On ultrasound a phyllodes tumor presents as a lobulated well-defined heterogeneous echogenic mass with internal cystic alterations and septations. Vascularisation is usually present in the solid components. Magnetic resonance imaging (MRI) shows a well-defined, lobulated mass with internal septations. The cystic components are hyperintense on T2-WI. The solid components enhance after contrast administration, shown as hyperintensity on T1-WI. Kinetic curve pattern can be gradual slow or rapid enhancement. Primary differential diagnosis consists of fibroadenoma, which is the most frequent fibroepithelial tumor. Clinical arguments for phyllodes are peak incidence at the age of 45 years compared

with fibroadenoma before 30 years. Rapid growth is also suspicious for phyllodes tumor. Mammography and ultrasound are insufficient to differentiate phyllodes tumor from fibroadenoma. The presence of fluid-filled, elongated spaces or clefts within a solid mass are characteristic, but not pathognomonic for phyllodes tumor. MRI for differentiation has been suggested in literature with conflicting results. MRI can be useful for evaluation of internal structure, enhancement pattern and kinetic curve assessment when differentiating with other well-circumscribed malignant tumors as intracystic / invasive papillary carcinoma or metaplastic carcinoma. Preoperative MRI studies describe various phyllodes tumor characteristics to correlate with histological grade: tumor size, internal non-enhanced septations, silt-like changes in enhanced images, signal changes from T2-weighted to enhanced images, irregular wall, tumor SI lower than or equal to normal tissue on T2-WI and low ADC (equals stromal hypercellularity). Diagnosis is nevertheless based on anatomopathology and pre-operative tissue sampling is necessary. Fine needle aspiration is inaccurate and even core biopsy has moderate sensitivity due to tumor heterogeneity causing inadequate sampling. These factors render pre-operative diagnosis challenging. Surgery is the only therapeutic option since phyllodes tumor is not proven sensitive to radio- or chemotherapy. Wide resection margin of at least 1 cm is advocated to prevent local recurrence. Breast conservative surgery is preferred if possible. The prognosis is good; the tumor rarely metastasizes.

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Mobile mass in the breast: report of two unusual cases

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A 36-year-old and a 35-year-old woman presented with a recently detected palpable and mobile mass in the upper outer quadrant of the right breast. The first patient had no significant personal history though she had two relatives with breast cancer (mother at 51 years, aunt at 50 years). The second woman has had resections of multiple

bilateral fibro-adenomas but no familial history of breast cancer.

Mammography showed no abnormalities in the first case, but a lobulated, nodular lesion with smooth borders and rather low density in the second patient. Ultrasound confirmed the presence of a superficial, hyporeflexive, nodular lesion with smooth borders in both women. Although the above mentioned features were reassuring, biopsy was performed and unexpectedly mucinous carcinoma was diagnosed.

Comment

Mucinous carcinoma counts for 1-7% of all breast carcinomas and is usually seen at post-menopausal age. Clinical, mammographic and sonographic features are benign. Macroscopically, a mucinous tumor is round, well circumscribed and non encapsulated, with pushing margins and a gelatinous surface. Microscopically, groups of uniform epithelial cells floating in large extracellular mucin lakes can be detected. Mucinous carcinomas can be subdivided in a pure form and a mixed type, containing the above mentioned cells combined with nonmucinous components of invasive ductal carcinoma. Our first patient had a mixed tumor, the second patient a pure type of mucinous carcinoma. This division is important regarding prognosis. Pure mucinous carcinomas have a 10 year survival of 87-90.4% and a 14-15% chance of lymph node metastasis unlike the mixed forms which have a poorer 10 year survival of 54-66% and a higher chance of developing lymph node metastasis of about 46%. This higher chance was reflected in our patients: the former had a micrometastasis in the sentinel node, the latter had negative sentinel nodes.

On MR images, a lobulated, oval or round mass can be detected with smooth borders, a high T2 signal intensity, due to the mucin components and an iso- to hypointense signal on T1. After admission of gadolinium, heterogeneous enhancement is seen, showing different dynamic patterns. A mucinous carcinoma of the pure type, as in our second patient, has a persistent, gradually enhancing pattern. Presence of a large amount of mucin delays the intralesional diffusion of contrast material, unlike in case of higher cellularity earlier enhancement is seen. In a mixed type tumor, as in our first patient, the invasive ductal carcinoma components in between the pure-mucinous components, cause strong enhancement in early and delayed phase.

In conclusion, mammography and ultrasound in patients suffering from mucinous carcinoma, show no morphological signs predictive of malignancy, possibly leading to a delayed diagnosis. MR findings can be crucial in pointing out the correct diagnosis, but biopsy is the only way to confirm and should therefore be considered in case of a new lesion or in case of sudden growth of a known lesion, even when associated with benign features.

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