DIGITAL MAMMOGRAPHIC CHARACTERISTICS OF MASSES pdf

1: Evaluation of Palpable Breast Masses - - American Family Physician

6 Digital Mammographic Characteristics of Masses Digital Mammographic Technique for Masses. In general, digital mammographic display of breast masses is similar to screen-film. 1 The relatively equivalent visibility is supported by in vitro screen-film and digital mammographic comparison of surgical specimens, 2 as well as prospective clinical evaluation of women with mammographic masses. 3.

Fourteen-gauge ultrasonographically guided large-core needle biopsy of breast masses. Cancer facts and figures Accessed online October 14, , at: SEER â€" public-use data. Proportion of breast cancer cases in the United States explained by well-established risk factors. J Natl Cancer Inst. Postmenopausal estrogen and progestin use in relation to breast cancer risk. Cancer Epidemiol Biomarkers Prev. Hormone replacement therapy regimens and breast cancer risk 1. Body mass index, serum sex hormones, and breast cancer risk in postmenopausal women. Mammographic densities and the prevalence and incidence of histological types of benign breast disease. Eur J Cancer Prev. Biopsy confirmed benign breast disease, postmenopausal use of exogenous female hormones, and breast carcinoma risk. Use of oral contraceptives and breast cancer risk: Breast cancer and hormonal contraceptives: Risks and benefits of estrogen plus progestin in healthy postmenopausal women: Characteristics of cystic breast disease with special regard to breast cancer development. The rational clinical examination. Does this patient have breast cancer? The screening clinical breast examination: Am J Prev Med. Mammography versus clinical examination of the breasts. J Natl Cancer Inst Monogr. How reliable is modern breast imaging in differentiating benign from malignant breast lesions in the symptomatic population? Cystic lesions of the breast: Comparison of the performance of screening mammography, physical examination, and breast US and evaluation of factors that influence them: The accuracy of breast ultrasound in the evaluation of clinically benign discrete, symptomatic breast lumps. Performance of diagnostic mammography for women with signs or symptoms of breast cancer. Quantitative characterization of mass lesions on digitized mammograms for computer-assisted diagnosis. Screen film vs full-field digital mammography: Comparison of full-field digital mammography with screen-film mammography for cancer detection: Comparative study in patients with microcalcifications: Accuracy of MR imaging in the work-up of suspicious breast lesions: Value of MR imaging in clinical evaluation of breast lesions. Breast augmentation and reconstructive surgery: MR imaging of implant rupture and malignancy. MR imaging of the ipsilateral breast in women with percutaneously proven breast cancer. MR imaging-guided sonography followed by fine-needle aspiration cytology in occult carcinoma of the breast. MR imaging findings in the contra-lateral breast of women with recently diagnosed breast cancer. Efficacy of MRI and mammography for breast-cancer screening in women with a familial or genetic predisposition. N Engl J Med. Accuracy of mammographic appearances after breast fine-needle aspiration. Am J Obstet Gynecol. Fine-needle aspiration of clinically suspicious palpable breast masses with histopathologic correlation. Role of sample adequacy in fine needle aspiration biopsy of palpable breast lesions. US-guided core-needle biopsy of the breast: A comparison of aspiration cytology and core needle biopsy in the evaluation of breast lesions. Core biopsy vs fine needle aspiration cytology in a symptomatic breast clinic. Eur J Surg Oncol. A new score for the evaluation of palpable breast masses in women under age Usefulness of the triple test score for palpable breast masses. A prospective review of the decline of excisional breast biopsy. Combined fine-needle aspiration, physical examination and mammography in the diagnosis of palpable breast masses: The value of ultrasound-guided fine-needle aspiration cytology of the breast: Replace fine needle aspiration cytology with automated core biopsy in the triple assessment of breast cancer. Ann R Coll Surg Engl. Evaluation of abnormal mammography results and palpable breast abnormalities. Prospective evaluation of the value of combined mammographic and sonographic assessment in patients with palpable abnormalities of the breast.

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2: Found a Breast Mass? What does it mean? - Moose and Doc

Most breast masses occur due to benign causes, but certain characteristics of a breast mass may be more suspicious for breast cancer. This page is getting a little old, but still has some great information.

Global asymmetry is when there is substantially more tissue in one breast compared to the other and occupies at least one quadrant of the breast. Focal asymmetry lacks convex borders of a mass and occupies less than one quadrant of the breast. A developing asymmetry is a focal asymmetry that is new or enlarging or denser when compared to prior mammogram Fig. Unlike such developing focal asymmetry, hormone-induced developing asymmetry is bilateral and global. Infection, trauma, and surgery are other nonsuspicious causes of a developing asymmetry that can be excluded by clinical history [31]. Developing asymmetry is an uncommon finding and reported in 0. On a screening examination, the incidence of cancer in a developing asymmetry has been reported to be Therefore, an uncomplicated developing asymmetry that is persistent after a diagnostic work-up unless proven to be due to benign finding such as a cyst by ultrasound should be categorized as a BI-RADS 4 with a recommendation for biopsy. A normal ultrasound does not preclude recommendation for a biopsy. Patient had failed to return for a recommended diagnostic mammogram in August In one series sonography had a negative predictive value for breast cancer of One palpable focal asymmetry without a sonographic correlate proved to be an invasive ductal cancer as did one without a palpable correlate. A negative sonography should not preclude biopsy in those with a palpable focal asymmetry. However, the presence of localized hyperechoic tissue matching an area of focal asymmetry is suggestive of a benign process [ ]. Those that are determined not to be a summation artifact after a diagnostic work-up and if new or enlarging or palpable following either a negative ultrasound examination or an ultrasound finding of an indeterminate mass get a category 4 assessment with a recommendation for a biopsy. Uncomplicated focal asymmetry seen on a baseline screening mammogram or when there are no prior mammograms available for comparison need to be worked up with diagnostic mammography and if persistent assessed by sonography; if there is no benign finding accounting for the focal asymmetry, the finding is considered probably benign with a recommendation for a short interval follow-up in 6 months. Uncomplicated global asymmetry does not require a diagnostic work-up and is assigned a BI-RADS 2 category with a recommendation for routine screening. Uncomplicated developing asymmetry is always recalled and if determined not to be due to summation or a sonographic benign correlate is categorized as a BI-RADS 4, with a recommendation for a biopsy. Asymmetry, global asymmetry, or a focal asymmetry associated with a palpable finding, architectural distortion, or suspicious microcalcifications is always an indication for biopsy. One-View Density Density that is visible on one view and defined as asymmetry is often due to summation artifact. Women are recalled for a diagnostic mammogram where supplemental views are obtained to exclude summation artifact as well as to identify a corresponding area on the orthogonal view. Two methods have been described to triangulate a lesion in two projections [38]. First is the arc method where the distance from the nipple to the density is used to form the radius of an arc with the nipple at its center. In the straight line method, the distance from the nipple to a perpendicular line passing through the density is measured. A corresponding density is sought in the orthogonal plane along the arc or the line; if none is found the finding is considered as an asymmetry. One-view asymmetry if not a summation artifact may be caused by an abnormality that is not included on the second view due to technical difficulties in including that area of the breast, such as lesions in the axillary fold, very medial in the chest, very posterior, or in the inframammary fold [38]. When a lesion is apparent only on the mediolateral oblique view, a straight mediolateral view has to be obtained to determine if the finding persists and its location in the breast. Lesions that are in the medial breast will move superiorly and those in the lateral breast will move inferiorly on the straight mediolateral views. Rolled views are obtained for lesions that are seen only in the craniocaudal view, to confirm that it is a real finding or not [39]. A new area of focal asymmetry is sometimes related to initiation of hormone replacement therapy [HRT]. In such cases repeat mammogram after cessation of HRT may demonstrate a resolution of the focal asymmetry. A developing asymmetry that may appear less prominent but persists

following cessation of therapy could at least in theory represent an estrogen-sensitive breast cancer [31].

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3: Digital Mammographic Characteristics of Masses | Radiology Key

Computer-aided diagnosis (CAD) for characterization of mammographic masses as malignant or benign has the potential to assist radiologists in reducing the biopsy rate without increasing false negatives.

X A radiologist interpreting a breast cancer screening mammogram will be alarmed when they discover a mass with a poorly defined or spiculated margin. This might indicate that breast cancer cells are infiltrating into the surrounding tissue. Most benign breast lesions and tumors have well-defined borders, but not all. A mass with an ill-defined margin will certainly need further testing, usually by ultrasound. Ultrasound is quite good for determining the nature of mass borders. If there is still cause for concern a biopsy may be necessary. Remember that a breast mass is but one of many diagnostic characteristics of breast cancer. Other techniques and attributes are then used to predict the potential malignancy of the lesion and the extent to which it may have spread. References American College of Radiology. Breast Imaging and Reporting Data System. Efficacy of mammography for detecting early breast cancer in women under Anticancer Res ; The reliability of measuring physical characteristics of spiculated masses on mammography. Mammographic features of ductal carcinoma in situ present on previous mammography. Measures of acutance and shape for classification of breast tumors. Invasive lobular carcinoma of the breast: Mammographic features of invasive lobular and invasive ductal carcinoma of the breast: Br J Radiol ; Mammographic density and epithelial histopathologic markers. Advances in Recent Technologies in Communication and Computing, The radiologic workup of a palpable breast mass. Cleve Clin J Med. Classification of breast masses via transformation of features using kernel principal component analysis. J Am Board Fam Med.

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4: Practical Digital Mammography - Beverly Hashimoto - Google Books

malignant masses that have been identified on full field digital mammograms collected at the Institute of Radiology of the University Erlangen-Nuremberg between and

There are relatively limited data concerning the appearance of asymmetries on digital compared with screen-film mammography. The studies examining patients with both techniques have shown no significant difference in the identification of malignant asymmetries. However, neither positioning nor diagnostic opinion differentiates digital from screen-film technique. General Evaluation of Mammographic Asymmetries Asymmetries differ from masses in that they do not appear to have a three-dimensional volume. They lack convex borders, usually contain interspersed fat, and do not have a consistent shape in orthogonal planes. There are two types of asymmetries: Global asymmetries involve at least one quarter of a breast and are not palpable. The tissue lacks a specific shape. The area consists of curvilinear lines with interspersed fat. There are no convex borders or margins. Although some patients have asymmetric fibroglandular composition on their baseline exams, other patients develop global asymmetries with increasing age. Overall, fibroglandular composition commonly decreases with age and is associated with reduction in endogenous estrogen. This normal reduction in fibroglandular composition may result in either global or focal asymmetries. Besides physiologic causes for global asymmetry, medications may affect breast composition and produce global asymmetries. For example, hormone replacement therapy promotes estrogen effect on the breast and may increase fibroglandular composition. Breast cancer sometimes metastasizes via lymphatic spread to the contralateral breast and produces lymphatic obstruction and lymphedema. Besides lymphatic obstruction, skin thickening may be caused by excess fluid or edema. Abscess with associated inflammation will produce skin thickening. Because abscesses are commonly subareolar, the skin thickening and increased density are primarily around the areola and decrease toward the axilla. Finally, systemic fluid overload from etiologies such as congestive heart failure and renal failure may produce skin thickening. Because factors outside the breast commonly produce global asymmetries, the work-up of global asymmetries should include a good patient history that covers any personal history of breast cancer. If skin thickening is present, then the patient should be questioned about personal history of malignancy, infection, and illnesses producing systemic fluid overload. If the patient is new to the mammographic facility, she should be questioned about availability of previous examinations, as comparison with earlier mammographic examinations are particularly useful to assess stability of asymmetry. If the global asymmetry is new, and the asymmetry cannot be identified as normal fibroglandular tissue or ascribed to a known etiology, then this asymmetry should be evaluated using the same methods as a focal asymmetry. Focal asymmetries are smaller than global asymmetries. With high-contrast digital postprocessing, focal asymmetries are frequently visible. Comparison with previous examinations is important to determine if the asymmetry is a developing density. Because asymmetries are difficult to differentiate from surrounding fibroglandular tissue in more than one view, malignancies that appear in this manner tend to be the most difficult ones to detect. Like global asymmetry, the focal asymmetry is evaluated to determine if it is normal asymmetric fibroglandular tissue or a mass. Besides lacking defined shape, margins, and conspicuity, normal fibroglandular tissue consists of curvilinear lines interspersed with tiny islands of fat that are directed to the nipple. If the asymmetry is on the periphery, the edges of the asymmetry gradually fade in a feathery pattern into the surrounding fat. One should evaluate the asymmetry for associated factors that strongly suggest the presence of a mass such as architectural distortion, calcifications, or associated palpable lump. If a focal asymmetry is suspicious, the lesion should be characterized and localized. Spot compression mammography applied on a focal asymmetry can confirm the presence of a mass by clarifying the shape, margins, and position of the abnormality. Furthermore, spot compression requires a technologist with skilled mammographic technique. Masses that initially appear as focal asymmetries tend to be subtle. This subtle appearance may be due to small size, obscuration of the mass by dense surrounding fibroglandular tissue, or increased compressibility. If the asymmetry represents a small mass surrounded by fibroglandular tissue, compression of the mass may not separate it from the surrounding

density. In these cases, multiple spot compression views may need to be performed to identify the lesion. Many times, even after multiple attempts, the asymmetry is not clearly identified on an orthogonal view. The final disadvantage of spot compression views is that this technique is operator dependent. Although digital mammography allows for more flexibility in imaging parameters, for subtle lesions, the mammography technologist should place the mass in the middle of the spot compression field for optimal visualization. This placement may not be difficult when the asymmetry is easily visible. However, if the asymmetry is subtle or visible in only one view, then placement of a poorly visible asymmetry is difficult. Other techniques used to evaluate focal asymmetries are alternative localizing views 90 degrees, either mediolateral [ML] or lateromedial [LM] and exaggerated craniocaudal [XCCL] views , rolled craniocaudal CC views, and shallow mediolateral oblique MLO views. If the location of the focal asymmetry is clear, then the ML or LM and XCCL views are useful to further localize the asymmetry for future sonographic evaluation or biopsy.

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5: Mammographic Signs of Breast Cancer | Oncohema Key

The predictive usefulness of the mammographic attenuation of a mass (called the mass density in the BI-RADS lexicon) remains controversial. Some investigators propose that high-density lesions are more likely to be malignant on account of the greater density of cellular components and reactive fibrosis surrounding a malignant tumor (1, 21, 22).

Digital Mammographic Technique for Masses In general, digital mammographic display of breast masses is similar to screen-film. In general, digital mammography produces high-contrast images and reduces the opacity of denser breasts, which increases the confidence of radiologists to exclude masses. Although the general workup of digital mammographic masses is similar to screen-film, soft copy viewing allows radiologists to manipulate the screening image more than screen-film. Changing the gray scale window width and level is one of the most useful digital mammographic methods to identify masses. This technique allows masses partially obscured by glandular tissue to be better visualized. Changing the window width and level also improves the identification of any associated suspicious findings, such as architectural distortion, skin thickening, and nipple inversion. Finally, retrospective gray scale manipulation of screening or diagnostic mammographic images can provide useful information to locally stage a biopsy-proven cancer by identifying malignant-appearing satellite masses or calcification clusters. Digital mammography workstations commonly have computer-aided detection CAD software included in their review protocols. CAD appears more sensitive for microcalcifications than for masses. In general, the CAD sensitivity and specificity increase with larger, more suspicious masses. For small masses, magnification may improve the definition of shape and margin. Furthermore, digital enlargement of the mass may provide information that affects further workup. Magnification may demonstrate fat within the mass, which would avoid additional workup. If magnification reveals possible calcifications, the imager may decide to recommend a spot magnification view rather than the nonmagnified spot compression view for the diagnostic workup. As in the evaluation of calcifications, an important strength of digital mammography is the ability to compare the appearance of masses from earlier digital examinations with the current exam. When masses are small or subtle, digital manipulation is extremely helpful in reproducing similar gray-scale images, which allows more confident assessment of growth or change in the shape of a mass. General Evaluation of Mammographic Mass As in screen-film, the initial step in a digital mammographic evaluation of a noncalcified lesion is to determine if it is a mass or an asymmetry. A mass has a three-dimensional volume; therefore, it exhibits a consistent shape and density in multiple imaging views or patient positions. Asymmetries tend to be visible only on one view and consist of short concave lines interspersed with tiny lucencies of fat. However, for purposes of practical assessment, one may divide these shapes into two groups: Group 1 includes round, oval, and lobular shapes; group 2, irregular shapes. Because of the difference in malignancy risk, each of these groups is treated differently Table 6â€”1. When the mass has a group 1 round, oval, or lobulated shape, any significant fat within the mass should be identified. Masses with fat, such as lymph nodes, hamartomas, oil cysts, and lipomas, are assessed as BI-RADS category 2, benign, and no further workup is necessary. Even if no fat is present within the mass, further workup may be avoided if there are earlier examination results for comparison, as these masses may be considered benign BI-RADS category 2 if they have been stable for at least 2 years. Therefore, if earlier exams are readily available, it is important to obtain them.

6: Digital Mammographic Technique for Mammographic Asymmetries | Radiology Key

Regarding the mammographic appearance of these tiny tumours, traditionally, a high-density spiculated mass was the most typical mammographic appearance of breast cancer. Positive predictive value for spiculated masses ranges from 67% to 96% [3].

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