Recognizing nodular panniculitis of the breast

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Learning objectives

To recognize nonsuppurative nodular panniculitis of the breast and to differentiate it from other entities.

Background

Panniculitis refers to a group of inflammatory conditions of the subcutaneous fat, commonly associated with subcutaneous crops of nodular fat necrosis and mild inflammatory changes of the overlying skin. Clinically it can present with multiple palpable nodules on the trunk or lower extremities, and less commonly on the upper extremities or face. Panniculitis may be idiopathic or have other underlying causes such as lymphoproliferative and collagen vascular diseases, trauma, #1-antitrypsin deficiency, pancreatitis, certain types of infections, etc [1-3]. It is believed that T cells are involved in the pathogenesis of panniculitis, even though this remains as a hypothesis [4]. Due to systemic inflammatory effects, the condition is frequently associated with various constitutional symptoms such as fever, malaise, arthralgias and/or myalgias. A wide variety of subtypes have been described, which can be divided into mostly septal or mostly lobular depending on the predominant location of the microscopic inflammation confirmed by histopathology. Further subtyping is based on the presence or absence of associated vasculitis.

Breast panniculitis has rarely been described, even though the condition can trigger a workup for malignancy when presenting as a tender palpable nodule. The lesions are usually tender, within a few centimeters in size and may be visualized on breast ultrasound as echogenic necrotic fat nodules with associated thickening and inflammation of the overlying subcutaneous fat [5]. Hereby we report the radiological features of breast lesions encountered in our practice that subsequently proved to represent nonsuppurative nodular panniculitis confirmed by histopathology.

Findings and procedure details

Mammography commonly showed relatively superficial irregular nodules without obvious calcifications (Figure 1), the findings falling within categories III - IV according to the Breast Imaging-Reporting and Data System (BIRADS) classification. It has been reported that in patients with suspected breast panniculitis mammography appears superior to ultrasonography, especially for evaluating early microcalcifications as they progress...
from suspicious to benign in appearance during the course of fat necrosis [6-10]. Early calcifications frequently simulate malignancy and may present in a ductal distribution, as fine linear-branching, amorphous or indistinct. However, as the calcifications increase in size and become increasingly coarse or dystrophic, they acquire a more benign appearance, being also easier visualized on ultrasound and MRI [9-11].

Fig. 1: Mammography showing small irregular nodules without obvious calcifications. 

References: radiology, USMF, USMF - Chisinau/MD

Computed tomography (CT) showed inhomogeneous subcutaneous lesions displaying higher attenuation than surrounding subcutaneous stroma. The modality had also the advantage of revealing additional lesions in the subcutaneous fat throughout the body, many of which were easily accessible for biopsy (Figure 2). With increasing use of CT for a variety of diagnostic pathways, breast incidentalomas are identified more frequently, even though benign and malignant lesions may not be safely distinguished from each other on standard chest CT [12].
**Fig. 2**: Computed tomography revealing additional lesions in the subcutaneous fat throughout the body, many of which are easily accessible for biopsy.

**References**: radiology, USMF, USMF - Chisinau/MD

Breast MRI improved depiction and delineation of all breast lesions and provided additional information that could be useful in the differential diagnosis. Most panniculitis lesions displayed decreased signal intensity on T1 weighted images and markedly increased signal intensity on Inversion Recovery (IR) sequences with fat suppression (Figure 3).
Most lesions displayed decreased signal intensity on T1 weighted images and markedly increased signal intensity on Inversion Recovery (IR) sequences with fat suppression.

References: radiology, USMF, USMF - Chisinau/MD

Benign MRI features include high signal intensity on T1-weighted images and low signal intensity on fat-suppressed images suggesting fat, local cutaneous involvement, and continuous rim enhancement on MRI kinetic analysis instead of a wash-out curve [6-8, 13]. During the reparative and final stage, however, breast panniculitis may present with indistinct or spiculated margins and architectural distortion on ultrasonography, mammography and MRI, which may be indistinguishable from breast malignancy especially when the inflammatory changes are associated with vasculitis [6-8, 13].

Histopathology can be useful for determining the type of panniculitis, differentiation from other lesions and guiding the therapy. However, the diagnosis should always be based on both clinical and histological findings in order to exclude a variety of conditions such as local infections, lymphoproliferative disorders, certain malignancies, alpha-1-antitrypsin deficiency, pancreatitis, collagen vascular diseases, etc [4]. Responses to corticosteroids, chloroquine, azathioprine, thalidomide, cyclophosphamide, methotrexate tetracycline, cyclosporin A and a host of nonsteroidal medications like ibuprofen and indomethacin have been reported in some patients [1-4, 9, 14-16]. However, a standardized treatment has yet to be established and this might be related to developing
a universally accepted consensus about the diagnostic criteria, disease staging and classification [4, 15].

The prognosis of panniculitis is extremely variable, depending on the disease extent and affected organs. Thus, in patients with only cutaneous disease the prognosis is good, while prominent visceral involvement may be associated with a poor prognosis and eventually lead to death from panniculitis involving the heart, lungs, liver, pancreas or kidneys [17-19]. The most frequent causes of death that have been reported in such patients are related to sepsis, hepatic failure, hemorrhage, and thrombosis [16, 19].

Conclusion

The imaging findings can provide valuable information in patients with suspected breast panniculitis and may prove especially useful when the clinical and biopsy features are equivocal.

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