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Breast Imaging

Nodular fasciitis of the breast in an elderly woman

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ABSTRACT

Nodular fasciitis is a benign proliferation of fibroblasts and myofibroblasts most commonly found in the soft tissues of the upper extremities and the trunk of young to middle-aged adults. Nodular fasciitis is infrequently encountered in the breast and in the elderly. We report a case of a 69-year-old woman presenting with a palpable breast mass with imaging features that mimicked malignancy. Knowledge of this entity is important to allow proper radiological and pathologic concordance and patient management.

Case report

A 69-year-old woman presented with a chief complaint of a tender palpable mass in her left breast, which she noticed 3 days before presentation. On physical examination, a firm mobile 1 × 1.5 cm mass was detected at the 9-o'clock position of the left breast overlying the left lateral sternum. Some mild tenderness was elicited on palpation, but the patient showed no overlying skin changes or nipple discharge. The patient denied any recent trauma, and had no significant past medical history and no family history of breast cancer.

Diagnostic mammography showed heterogeneously dense breast tissue with a 7-mm asymmetry in the medial left breast posterior depth, seen on the craniocaudal and the exaggerated medial craniocaudal views only (Fig. 1). Ultrasound of the palpable area of concern showed a 7 × 5 × 8 mm heterogeneous echogenicity mass with internal vascularity, suspicious for malignancy (Fig. 2). Ultrasound of the left axilla demonstrated normal-appearing lymph nodes.

An ultrasound-guided needle core biopsy was performed of the left breast mass, and histopathology revealed a lesion composed of short, intersecting fascicles of cytologically bland spindled cells with areas of microcystic change, erythrocyte extravasation, and a mild mixed chronic inflammatory infiltrate. Mitoses were present, but no atypical mitoses were seen. By immunohistochemistry, the lesional cells were negative with multiple cytokeratin antibodies, arguing against a metaplastic spindle cell mammary carcinoma. Smooth muscle actin was

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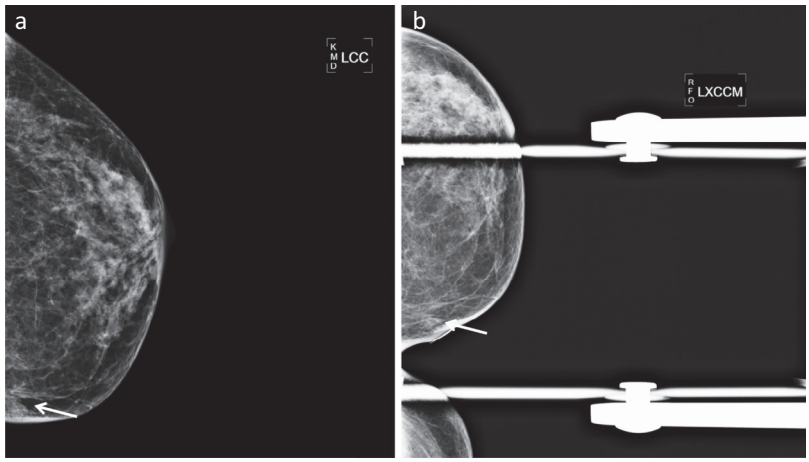

Fig. 1 – LCC (A) and exaggerated craniocaudal medial (B) mammogram shows an asymmetry in the medial breast (arrows). LCC, left craniocaudal.

positive in the majority of the spindled cells, in a characteristic "tram-track"-like pattern, supporting the myofibroblastic nature of the cells. Together, the histologic and immunohistochemical features were diagnostic of nodular fasciitis (Fig. 3).

Annual screening mammography was recommended after the benign, concordant biopsy result. The patient has been followed up for 3 years with no progression of the mass on physical examination or on screening mammography.

Discussion

First described by Kornwaler et al. in 1955, nodular fasciitis is a proliferation of fibroblasts and myofibroblasts [1]. Nodular fasciitis is fairly common in the soft tissues and most often presents as a solitary, small, and occasionally painful subcutaneous nodule that develops rapidly, often in the course of 4-8 weeks [2]. Although nodular fasciitis has been identified in patients of all ages, it is most commonly observed in young adults between the ages of 20 and 40, affecting men and women equally [3,4]. The anatomic distribution of nodular fasciitis is wide, but it occurs most commonly in the upper extremities, particularly in the soft tissues of the forearm, followed by the trunk, and the head and neck [5]. Although the exact pathogenesis of nodular fasciitis is not well understood, nodular fasciitis frequently harbors a recurrent genetic event characterized by a fusion of the *USP6* locus to one of a number of partner genes [6]. In light of the recurrent genetic rearrangement, it is unclear whether this is best classified as a reactive or a neoplastic process. In any event, nodular fasciitis behaves as a self-limiting lesion with a very low likelihood of recurrence among those cases that are surgically excised.

Although the pathologic characteristics of nodular fasciitis vary, the lesions are relatively well circumscribed but often infiltrate into the surrounding soft tissues, with a tan to a grayish-white appearance. Lesions may have a mucoid consistency caused by myxoid degeneration [3]. Histologically, nodular fasciitis is predominantly composed of loosely formed fascicles of plump (myo)fibroblasts set in a variably myxoid stroma with scattered inflammatory cells, microcystic change, and extravasated red blood cells. Although there may be frequent mitoses, atypical mitoses are not present [7]. The infiltrative growth pattern, high cellularity, and mitotic activity can mimic a soft tissue sarcoma. However, in contrast to most soft tissue sarcomas, nodular fasciitis is generally small, located in the subcutaneous tissues and does not show a

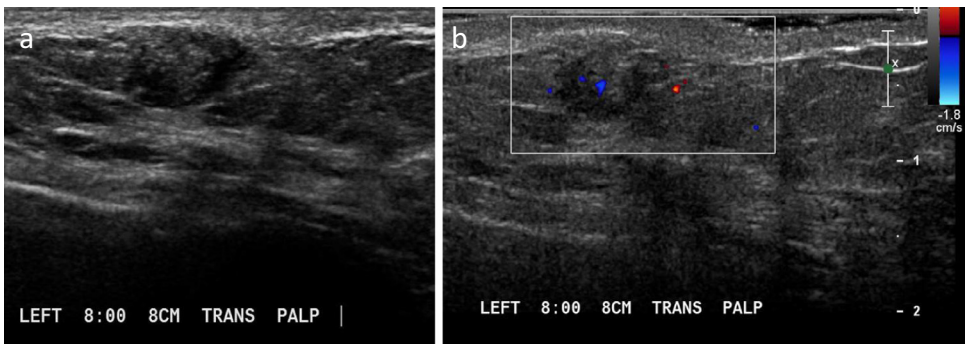

Fig. 2 – Ultrasound of the left breast shows (A) an irregular, heterogeneous echogenicity mass with indistinct and microlobulated margins and no posterior acoustic features. (B) Associated Doppler flow was seen within the mass.

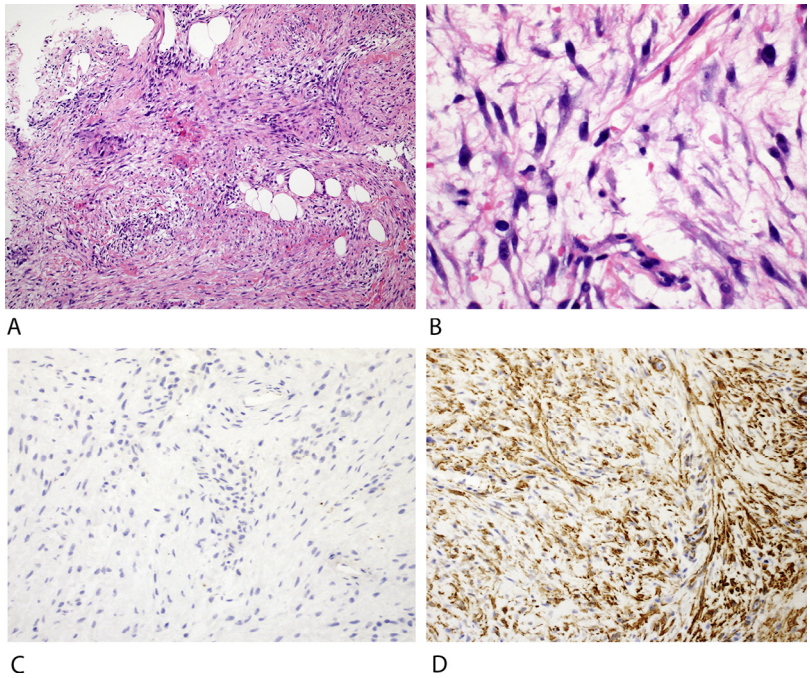

Fig. 3 – Micrographs of a mammary nodular fasciitis show a relatively well-circumscribed but focally infiltrative, spindle cell lesion arising in the soft tissues of the breast, forming short intersecting fascicles (A, H&E, 40×) with areas of microcystic degeneration and erythrocyte extravasation and lacking a significant cytologic atypia (B, H&E, 400×). Multiple immunohistochemical cytokeratin stains are negative in the lesional cells (C, CK5/6), and there is a strong expression of smooth muscle actin (D), supporting the diagnosis. H&E, hematoxylin and eosin.

significant cytologic atypia or atypical mitotic figures [3]. In difficult cases, molecular genetic or cytogenetic testing for *USP6* genetic rearrangements can be helpful to confirm the diagnosis.

Although cases of nodular fasciitis of the breast have been reported in the literature, it is rare. Clinically, nodular fasciitis often presents as a rapidly growing, palpable, and often tender mass. On mammography, most cases appear as a high-density mass with spiculation, distortion, and indistinct margins [8,9]. On ultrasound, lesions often appear as irregular hypoechoic masses with indistinct margins [2,8]. The radiological differential diagnosis includes carcinoma. Similarly, the most important considerations within the pathologic differential diagnosis are metaplastic spindle cell mammary carcinoma and desmoid-type fibromatosis. In select cases, immunohistochemical testing for cytokeratin expression with multiple antibodies reactive to wide-spectrum and high–molecular weight cytokeratins, along with p63, is necessary to exclude carcinoma. Because the lesion has no unique radiological features, core needle biopsy is necessary for a pathologic diagnosis and for the exclusion of malignancy. Surgical excision can be performed for diagnosis as well as for treatment, although spontaneous regression with conservative management has also been observed [10]. An awareness of the imaging features of nodular fasciitis and its self-limited clinical course is important to prevent unnecessary imaging follow-up and surgical intervention.

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