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Teaching cases

Mammary myofibroblastoma with extensive myxoedematous stromal changes: A potential diagnostic pitfall

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ABSTRACT

Myofibroblastoma (MFB) of the breast is a relatively rare, benign stromal tumor arising in the breast of both males and females. Several morphological variants have been recognized in the last two decades, including infiltrating, cellular, fibrous/collagenized, epithelioid/deciduoid-like cell, lipomatous and myxoid variants. Myxoid MFB is an extremely rare variant which can represent a potential diagnostic pitfall, posing differential diagnostic problems with other myxoid lesions occurring primarily in the breast parenchyma. We first report an unusual case of mammary MFB showing so extensive myxoedematous stromal changes that obscured the underlying neoplastic cells, rendering difficult its recognition as MFB. Tumor was composed of a few bland-looking spindled, stellate cells embedded in an abundant myxoedematous stroma containing thin and thick collagen fibers and numerous blood vessels with fibrin and foamy histiocytes deposits in their walls. Identification of a small-sized cellular area, with morphological and immunohistochemical features consistent with mammary-type MFB, was crucial for a correct diagnostic interpretation of the lesion. These unusual stromal and vascular features are likely morphological changes to which undergo long-standing mammary MFBs in response to ischemic, traumatic or inflammatory stimuli. Differential diagnostic problems with benign and malignant myxoid lesions of the breast parenchyma are discussed. The present case, for which the term "mammary MFB with extensive myxoedematous stromal changes" is proposed, contributes to widen the morphological spectrum of this unusual mammary tumor, suggesting that when pathologist is dealing with a hypocellular myxoedematous lesion of the breast, a MFB should be ruled out.

Introduction

Myofibroblastoma (MFB) of the breast is an unusual tumor that belongs to the family of the "benign stromal tumor of the breast" [12,18]. In its classic type, MFB is usually composed of bland-looking spindle cells exhibiting a variable fibro-myofibroblastic differentiation, and arranged in short, straight, haphazardly intersecting fascicles interrupted by thick collagen fibers [12,13,18]. Tumors with similar, if not identical morphology and immunohistochemical profile, have also been reported with the term "mammary-type MFB" in soft tissues [25] and vulvo-vaginal region [21]. Notably, mammary and extra-mammary MFBs share the same chromosomal aberration, namely 13q14 deletion, as indicated by FISH analyses showing monoallelic deletion of *RB1* and *FOXO1* [8,22]. Similar cytogenetic findings have also been documented in spindle cell lipoma of soft tissues and cellular angiofibroma of the lower female genital tract, suggesting that all these tumors are genetically linked, likely arising from a common precursor cell [4,8,22].

Over the last two decades, the morphological spectrum of mammary MFB has been broadened by the recognition of several variants, including infiltrating, cellular, fibrous/collagenized, epithelioid/deciduoid, lipomatous, myxoid, and palisaded/Schwannian variants [11,15,17–19,23]. Only rarely subtypes of the above mentioned variants [9] or coexistence of two different variants in the same tumor have been reported [24,33]. Although some of these variants seem to be of academic interest, such as MFB with infiltrative borders or fibrous/collagenized MFB, the recognition of others, such as epithelioid/deciduoid-like, lipomatous or myxoid variants, may be crucial to prevent an overdiagnosis of malignancy, especially when evaluating small incisional biopsies [11,19,24].

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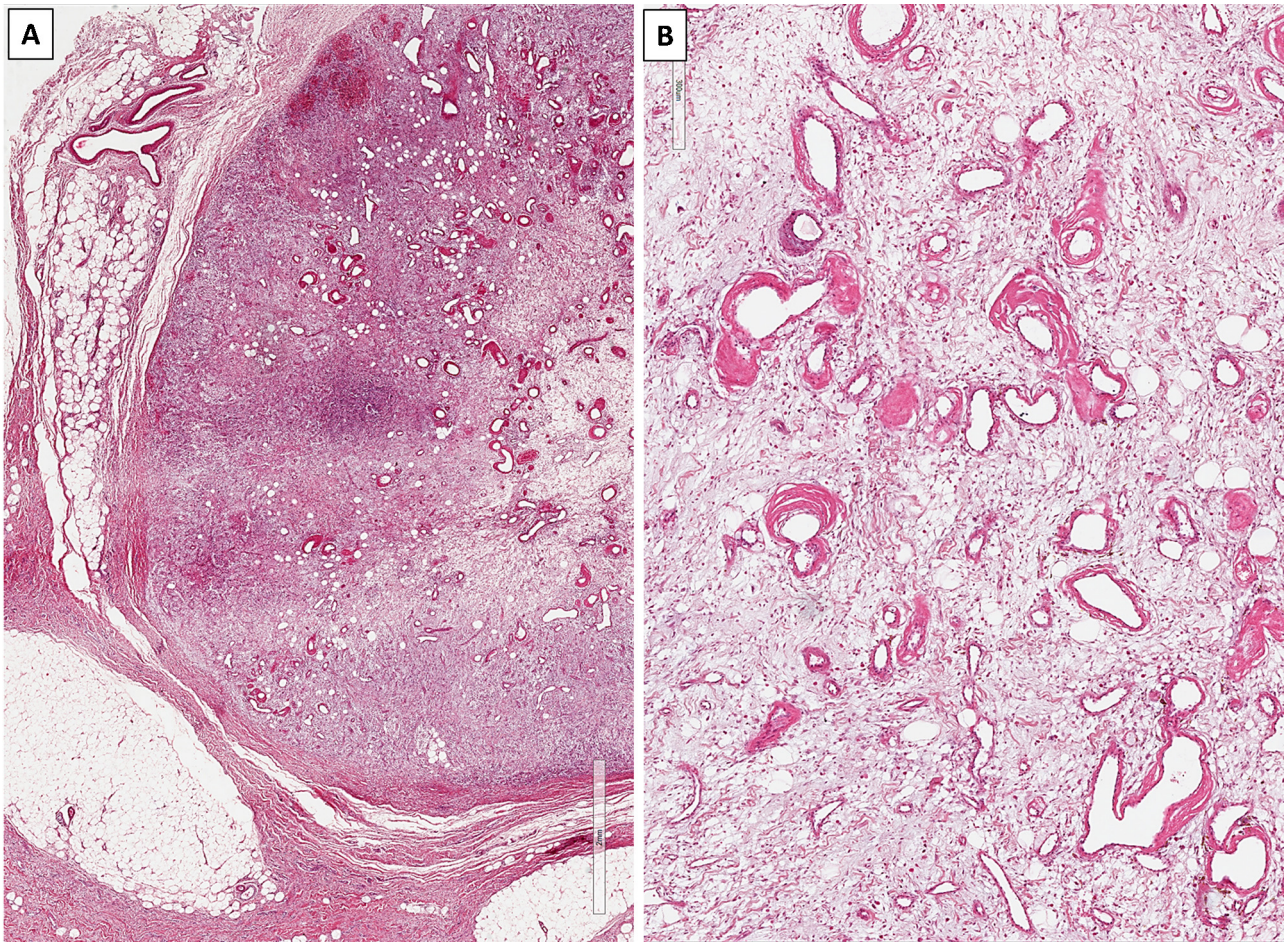

Fig. 1. (A) Low magnification showing a nodular myxoedematous lesion containing numerous thick-walled blood vessels (hematoxylin/eosin; original magnification 40×). (B) Tumor stroma is hypocellular and myxoedematous in nature; medium-sized blood vessels contain eosinophilic fibrinoid material in their walls (hematoxylin/eosin; original magnification 60×).

It is known that mammary MFB may exhibit focal myxoid stromal changes [12,18], while blood vessels may undergo hyalinization in their walls [9,18]. However, the term "myxoid MFB", first coined by Magro et al. in 2007 [15], has been used to designate those rare tumors containing prominent myxoid stroma in which spindle- and stellate-shaped cells are dispersed. Since that original description dealing with two cases, only one additional case has been reported in the literature so far [3].

We herein report a unique case of mammary MFB which was almost completely replaced by extensive myxo-oedematous stromal changes. Only after a careful search, the identification of a small residual area consistent with a conventional mammary-type MFB was helpful for a correct diagnostic interpretation. Differential diagnosis with myxoid lesions of the breast parenchyma is discussed.

Clinical history

A 65-year old man presented a slightly painful right breast lesion. Physical examination revealed a mobile mass located in the upper outer quadrant of his right breast. No axillary lymphadenopathy was observed. Ultrasonography revealed a circumscribed nodular mass without calcifications, measuring 2 cm in its greatest diameter, located in the upper outer quadrant of his right breast. The patient underwent lumpectomy without axillary lymphadenectomy. The patient is well with no recurrence after a follow-up period of 7 years.

Materials and methods

Surgical specimen was submitted for histological examination in neutral-buffered 10% formalin, dehydrated using standard techniques, embedded in paraffin, 5 μm sections cut and stained with hematoxylin and eosin (H&E), Alcian blue at pH 2.5 and periodic acid-Schiff (PAS). Immunohistochemical studies were performed with the labeled streptavidin-biotin peroxidase detection system using the Ventana automated immunostainer (Ventana Medical Systems, Tucson, AZ). The antibodies tested were vimentin (dilution 1:100); α-SMA (dilution 1:200); desmin (dilution 1:100); myogenin (dilution 1:100); h-caldesmon (dilution 1:100), S-100 protein (dilution 1:500); CD99 (dilution 1:100); CD34 (dilution 1:50); B-cell lymphoma 2 (Bcl-2) protein (dilution 1:100); CD10 (dilution 1:200); CD117 (dilution 1:400); cytokeratins (AE1/AE3 clone; dilution 1:50); epithelial membrane antigen (EMA) (dilution 1:100); p63 (dilution 1:200); anti-human melanosome (HMB45) (dilution 1:300); estrogen receptor (ER) (dilution 1:100); progesterone receptor (PR) (dilution 1:100); all from Dako, Glostrup, Denmark. Appropriate positive and negative controls were included.

Pathological findings

Macroscopically, a well-circumscribed, unencapsulated tumor mass, 2 cm across, soft in consistency, was seen. On cut section, the nodular mass was myxoid and whitish in color. Histologically,