Case Report

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Nodular Fasciitis of the Breast Mimicking Phyllodes Tumors: A Case Report and Literature Review

엽상 종양처럼 보이는 유방의 결절성 근막염: 증례 보고 및 문헌 고찰

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Nodular fasciitis is a benign proliferative lesion of the fibroblasts and/or myofibroblasts, generally detected in the soft tissue of the upper extremities. It has also been reported in the lower extremities, head, and neck, and rarely in the breast. Its rarity and nonspecific clinical and radiological features resemble those of malignant tumors of the breast and make the differential diagnosis and management difficult. Herein, we present a rare case of nodular fasciitis of the breast, which was initially suspected to be a phyllodes tumor.

Index terms Breast Neoplasms; Fasciitis; Fibroblast; Mammography; Ultrasonography

INTRODUCTION

Nodular fasciitis is a benign proliferative lesion of fibroblasts and/or myofibroblasts usually found in the soft tissue of the upper extremities. It also has been reported in lower extremities, head and neck, and very rarely in breast. Nodular fasciitis of the breast reveals nonspecific clinical and radiological characteristics, often similar to breast cancer, and thus it is challenging to diagnose and requires histopathologic confirmation (1). Herein, we present a rare case of nodular fasciitis of the breast, which was initially suspected to be phyllodes tumor, and re-

view the literature focusing on its clinical, radiologic, and histopathologic features.

CASE REPORT

A 44-year-old female was referred to our institution for further evaluation and treatment of a suspicious lesion on mammography in her right breast. The patient initially visited a local clinic in awareness of a palpable mass in her right breast two months before the visit. The size of palpable mass was noticeably increased in two months and was detected by the patient. Initial screening mammography at local clinic showed an oval shaped, partially obscured, slightly hyperdense mass in the right lower central breast (Fig. 1A). No suspicious microcalcification was noted in both breasts.

Physical examination demonstrated a well-defined, firm mass measuring 50 mm in diameter in her right lower central breast, 6 o'clock direction and 5 cm from the nipple. She had no history of malignancy or trauma, and no family history of breast cancer.

Breast ultrasonography revealed a well-circumscribed, partially irregular, hypoechoic solid mass with mild posterior acoustic enhancement located in the subcutaneous fatty layer at 6 o'clock direction and 3 cm from the nipple (Fig. 1B). Small anechoic cystic components were present within the mass (Fig. 1B, arrows). Additional strain elastography US revealed deformability of large amount of the lesion with little stiff areas indicating elasticity score of two. Based on the radiologic and clinical findings of sudden onset with rapid progression, the lesion was assessed as Breast Imaging-Reporting and Data System (BI-RADS) category 4B.

Hence, US-guided core-needle biopsy was performed (Fig. 1B). Histopathologic examinations showed ductal hyperplasia with mildly to moderately increased stromal cellularity suggesting biphasic fibroepithelial tumor. These histopathologic and suspicious radiologic findings could not exclude the possibility of phyllodes tumor. Therefore, for confirmative diagnosis, the patient was treated with surgical wide excision.

Gross findings of the surgical specimen displayed solid, diffuse fibromyxoid tissue measuring 55 mm × 40 mm × 30 mm in size (Fig. 1C). Final histopathologic examinations showed spindle cell proliferation of varying cellularity without overt atypia (Fig. 1D). Multifocal extravasated red blood cells and inflammatory cells such as lymphocytes were present (Fig. 1E), which are characteristic microscopic findings of nodular fasciitis (2). Followed by the results of additional immunohistochemical staining, positive expression of smooth muscle actin (SMA) and negative expressions of Desmin and CD34, the mass was confirmed as nodular fasciitis.

This case report was approved by our Institutional Review Board, and the requirement for informed consent was waived (IRB No. 2022-03-001).

DISCUSSION

Nodular fasciitis is a benign proliferative lesion of myofibroblasts and fibroblasts that is rarely seen in the breast. Nodular fasciitis of the breast is categorized as one of the histological types of mesenchymal tumor according to the World Health Organization classification in 2012 (3). The pathogenesis is currently unknown; however, local injury is reported to be

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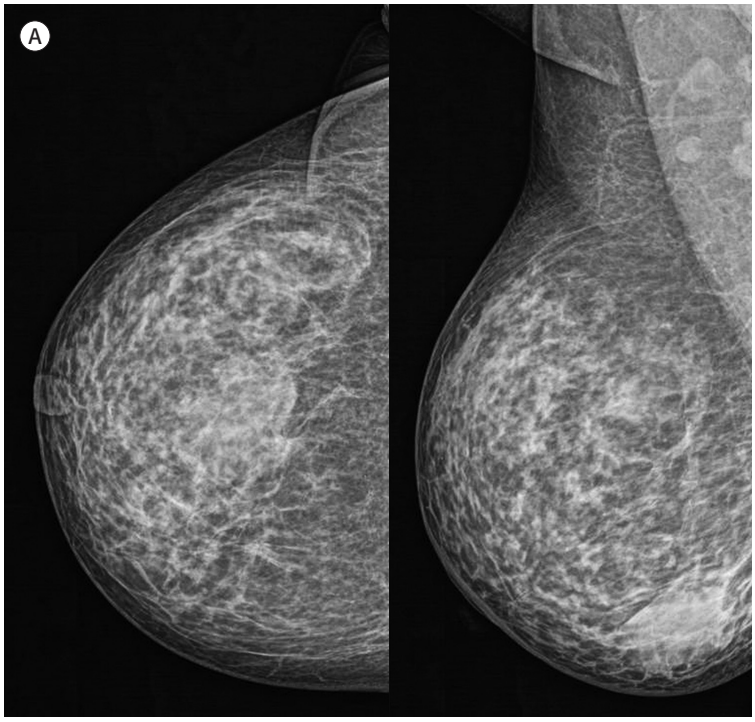
Fig. 1. Nodular fasciitis of the breast mimicking phylloides tumor in a 44-year-old female presenting with palpable mass in right breast.
A. Screening mammography shows an oval-shaped, partially obscured, slightly hyperdense mass in the right lower central breast. No microcalcifications are detected.
B. Breast US shows a well-circumscribed but partially irregular, hypoechoic, solid mass with suspicious small anechoic components (arrows) within the lesion. On transverse and longitudinal planes (upper), the lesion measurements are 40 mm × 17 mm × 43 mm. Strain elastography US (lower left) shows strain in most parts of the hypoechoic lesion, especially the center, with some areas of no strain in the periphery. US-guided core-needle biopsy was performed.



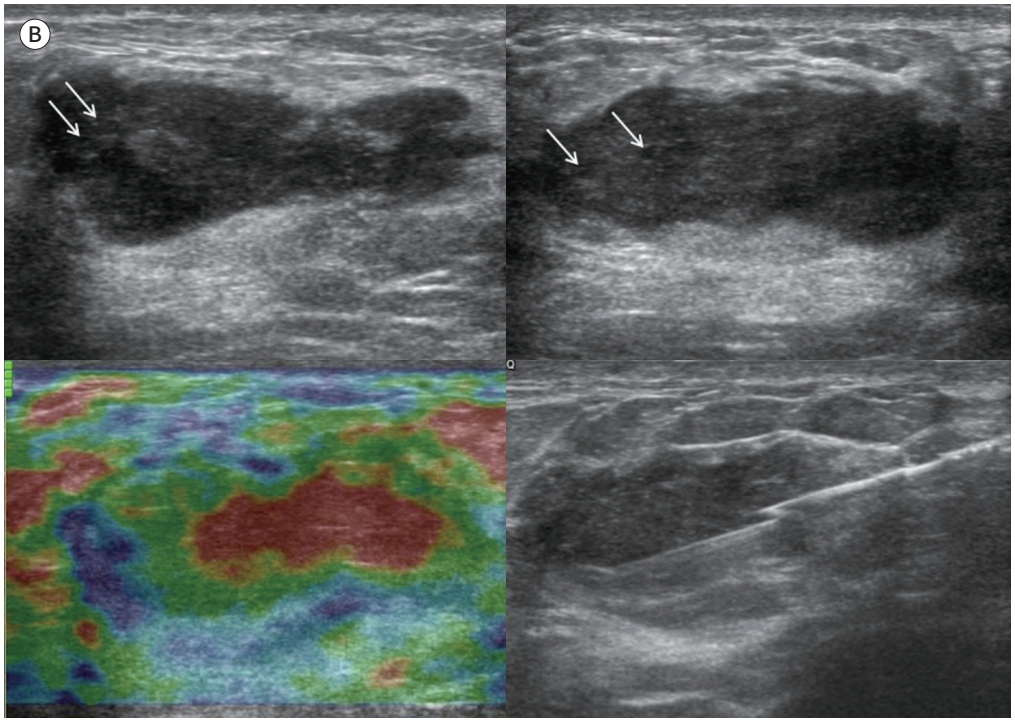
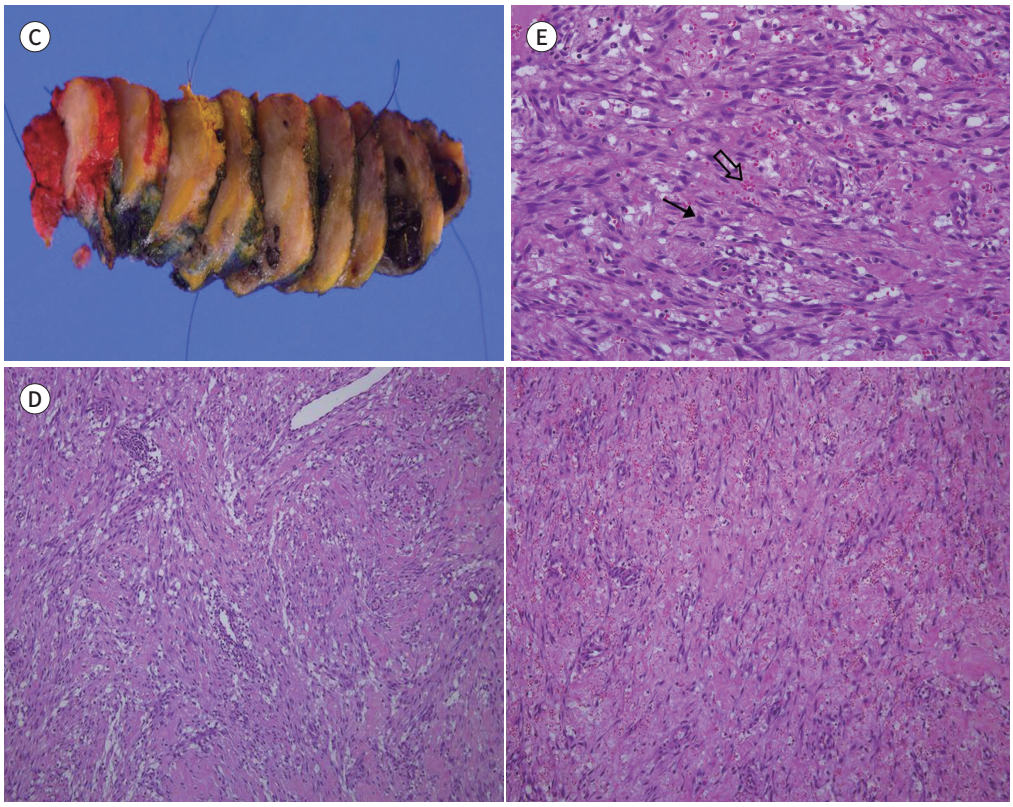


Fig. 1. Nodular fasciitis of the breast mimicking phylloides tumor in a 44-year-old female presenting with palpable mass in right breast.
C. A gross image of the resected mass shows a solid, diffuse fibromyxoid tissue measuring 55 mm × 40 mm × 30 mm.
D. Specimens from the mass show spindle cell proliferation without overt atypia and varying cellularity (left; cellular, right; paucicellular area; H&E stain, × 100).
E. Extravasated red blood cells (open arrow) and inflammatory cells (arrow) are present (H&E stain, × 200).
H&E = hematoxylin and eosin



relevant, triggering reactive proliferative process, although only about 10% among reported cases mentioned preceded history of trauma (1). The awareness of nodular fasciitis of the breast and its differential diagnosis are important because it often presents clinical and radiologic features that are suspicious for malignancy despite of its benign nature.

Nodular fasciitis of the breast clinically presents as a palpable mass, which is also characteristic in malignant tumors of the breast. Nonetheless, nodular fasciitis shows rapid clinical progression, which is not common in other breast nodules (4). It is primarily located in the superficial layer of the breast, within the subcutaneous tissue but may extend to the breast parenchyma or surrounding fat tissue (5). Associated skin retraction or axillary lymphadenopathy is rare as opposed to malignant tumors.

Radiological features of breast nodular fasciitis are usually nonspecific; the most common mammographic finding is a dense, microlobulated or irregular nodule (6). It can also be oval or round, well-circumscribed nodule. On ultrasonography, the mass is typically displayed as a hypoechoic solid mass with various margins including irregular and angular, which can be suspected as carcinoma. It may also show variable posterior features: posterior acoustic shadow, enhancement or hyperechoic halo (7). Due to its discordant image findings, which

mimic malignancy, whereas histopathologic findings of US-guided biopsy often indicate benign lesions, further evaluation or management is essential for confirmative diagnosis of breast nodular fasciitis. Thus, especially when the lesion is located in the superficial layer of the breast, differential diagnosis including other mesenchymal origin tumors like fibromatosis and malignant lesions such as sarcoma and phyllodes tumor, as in our case, is important in guiding further management. Based on our review of publicized literature, all reported cases were treated and finally diagnosed with surgical excision.

Microscopically, it is composed of myofibroblasts and/or fibroblasts without overt cytological atypia. Cellularity varies between and within lesions; early lesions are usually more cellular, whereas more mature lesions tend to have more collagen (8). The absence of cytonuclear atypia and the presence of multifocal red blood cell extravasation and inflammatory cells are key histopathologic characteristics of breast nodular fasciitis (9). In addition, immunohistochemical examinations show positive expressions of SMA.

Our case of breast nodular fasciitis was initially suspected as phyllodes tumor with suspicious potential of malignancy based on its clinical and radiological presentation as rapid growing, heterogeneous solid mass with anechoic cystic components on ultrasonography. Both diagnosis and treatment were accomplished by surgical wide excision. Although radiologic multimodalities help assess and diagnose breast nodules, it cannot be confirmed only by radiologic studies. It is challenging even for experienced radiologists to clearly distinguish benign nodular fasciitis from a malignant tumor in the breast based solely on imaging due to its unspecific radiologic features. However, radiologists need to consider the possibility of nodular fasciitis in differential diagnosis when a palpable, rapidly growing mass is detected in the superficial layer of the breast.

Author Contributions

Conceptualization, P.S.J.; data curation, C.Y.H., K.J.H.; supervision, P.S.J., K.J.H.; writing—original draft, C.Y.H.; and writing—review & editing, P.S.J., C.Y.H.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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엽상 종양처럼 보이는 유방의 결절성 근막염: 증례 보고 및 문헌 고찰

장윤화[1] · 박숙진[1]* · 김주헌[2]

결절성 근막염은 섬유아세포 및 근섬유모세포로 이루어진 양성 증식성 병변으로 주로 상지의 연조직에서 발견된다. 이 외에도 하지 및 두경부, 그리고 드물게 유방에서의 결절성 근막염이 보고되었다. 유방의 결절성 근막염은 드물고 임상 및 영상검사상 악성 종양과 유사한 특징을 보여 종양의 감별진단 및 치료 방법을 결정함에 있어 어려움이 있다. 저자들은 영상검사상 엽상 종양으로 의심되었던 유방의 결절성 근막염 소견을 경험하여 보고하고자 한다.

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