Int J Clin Exp Pathol 2016;9(7):7716-7719
www.ijcep.com /ISSN:1936-2625/IJCEP0026974

Case Report

Breast nodular fasciitis with abundant spindle cells and osteoclast-like giant cells mimicking inflammatory myofibroblastic tumor

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Received February 29, 2016; Accepted May 23, 2016; Epub July 1, 2016; Published July 15, 2016

Abstract: Nodular fasciitis is a relatively common lesion usually presenting in soft tissues. The occurrence in the breast is exceptional rare. Histologically, this tumor is characterized by plump spindle cells arranged in short fascicles. Occasionally, osteoclast-like giant cells may be present. Herein, we present a case of breast nodular fasciitis in a 46-year-old Chinese female. The tumor was predominantly composed of abundant spindle cells with light to moderate atypia and scattered osteoclast-like giant cells and lymphocytes reminiscent of inflammatory myofibroblastic tumor. The unusual histological appearance can pose a great diagnostic challenge. It may be easily misdiagnosed, especially if the specimen is limited or from fine-needle aspiration.

Keywords: Nodular fasciitis, breast, osteoclast-like giant cells, inflammatory myofibroblastic tumor

Introduction

Nodular fasciitis is a common lesion first described by Konwaler in 1955 [1]. It is usually considered a self-limiting, mass-forming fibroblastic/myofibroblastic clonal proliferation, which is also known as "pseudosarcomatous fasciitis". Nodular fasciitis can occur at any age, but usually in young people between the ages of 20 and 40, and in soft tissues and various organs including parotid gland, bladder [2, 3]. But, breast location is very exceptional, and about 33 cases are reported [4]. Nodular fasciitis is histologically characterized by plump fibroblastic/myofibroblastic cells arranged in short fascicles. Very rarely, the tumor may be present with multinucleated osteoclast-like giant cells and lymphocytes [5]. Herein, we present a case of breast nodular fasciitis in a 46-year-old Chinese female. Histologically, the tumor was predominately composed of sheets of atypical spindle cells and scattered lymphocytes reminiscent of inflammatory myofibroblastic tumor. The unusual histological appearance may pose a great diagnostic challenge. It may be easily misdiagnosed, especially if the specimen is limited or from fine-needle aspiration.

Case presentation

Clinical history

A 46-year-old female referred to our hospital for complaining of a mass about 2 cm diameter at her left breast for one month. Blood examinations were in normal levels. Mammography revealed a well circumscribed, solitary mass about 2×2 cm in the left breast. The mass was clinically diagnosed as a breast tumor, and then a mass excision was performed in our hospital. At surgery the mass was removed, and underwent diagnostic examination. According to the morphological and immunohistochemical findings, the tumor was diagnosed as a breast nodular fasciitis. She was alive with no lesion recurrence within 48 months of follow-up.

Methods

The resected specimens were fixed with 10% neutral-buffered formalin and embedded in paraffin blocks. Tissue blocks were cut into 4-μm slides, deparaffinized in xylene, rehydrated with graded alcohols, and immunostained with the following antibodies: cytokeratin (CK),

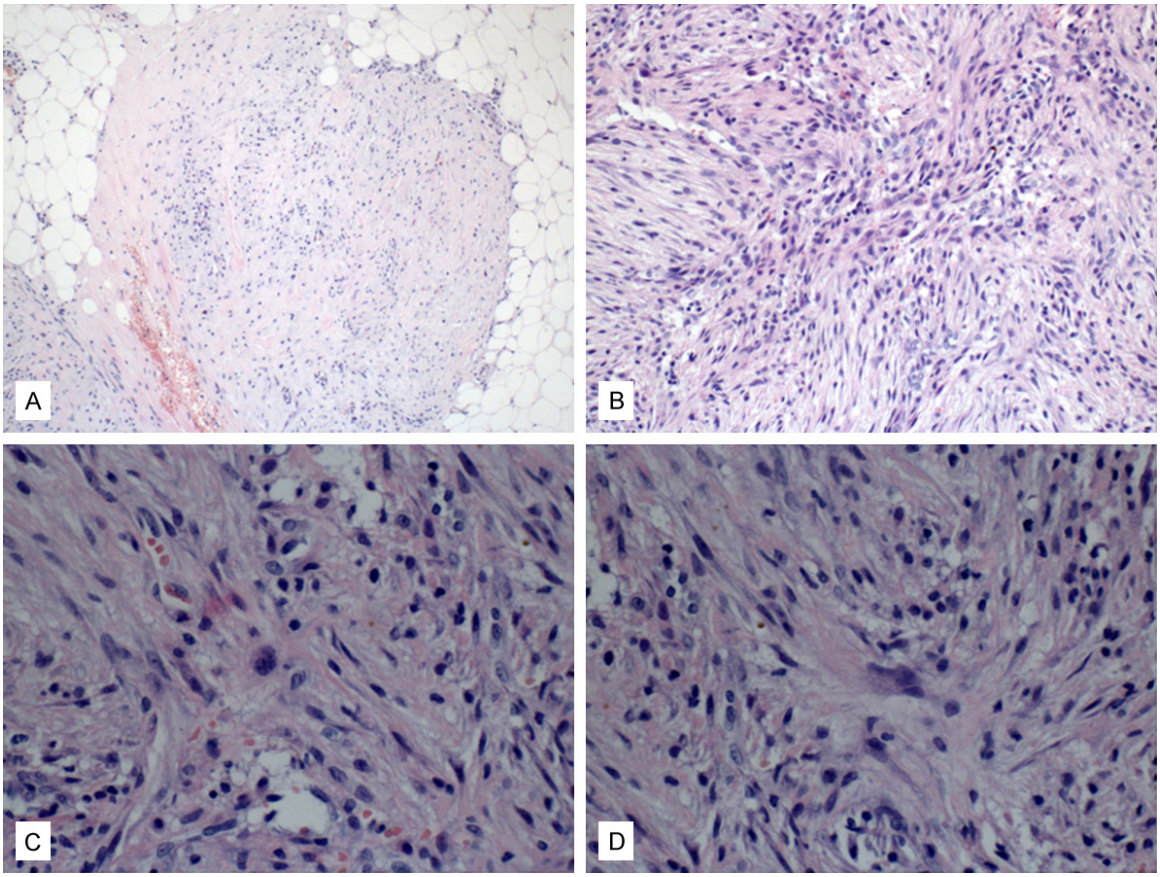

Figure 1. Morphological change of the lesion. A. The tumor was relatively well circumscribed. B. Numerous spindle cells were arranged into swirling patterns. C. The spindle cells had light to moderate cellular atypia, and extravasation of scattered lymphocytes, red blood cells. D. Scattered multinucleated osteoclast-like giant cells were focally present within the spindle cells.

CD68, Vimentin, CD34, Desmin, Actin (SM), bcl-2, NSE, S-100 and Ki67. Sections were stained with a streptavidin-peroxidase system (KIT-9720, Ultrasensitive TM S-P, MaiXin, China). The chromogen used was diaminobenzidine tetrahydrochloride substrate (DAB kit, MaiXin, China), slightly counterstained with hematoxylin, dehydrated and mounted. For the negative controls, the primary antibody was replaced with PBS.

Results

Gross features

Grossly, the mass was approximately 2×2×1.5 cm, and was relatively well circumscribed. The cut face of the tumor was firm and grey-white in colour.

Microscopic features

Histologically, the tumor was relatively well defined (**Figure 1A**). The tumor was predominantly composed of rich plump spindle cells (**Figure 1B**). The cells were diffusely arranged into solid sheets or whirling patterns. The cells had light to moderate cellular atypia, with pale or eosinophilic chromatin (**Figure 1C**). There was approximately 1 mitosis/50 high power in spindle cells. In addition, scattered multinucleated osteoclast-like giant cells and lymphocytes were present within the background of the diffuse spindle cells (**Figure 1D**).

Immunohistochemistry

Immunohistochemical staining showed that the spindle cells were diffusely positive for Actin (SM) (**Figure 2A**), bcl-2, NSE and Vimentin, negative for CK (**Figure 2B**), CD34 (**Figure 2C**), CD68, Desmin, and S-100. In contrast, osteoclast-like giant cells were positive for CD68, negative for Actin (SM). The Ki67 index was approximately 10% (**Figure 2D**). According to the morphological and immunohistochemical findings, the tumor was diagnosed as a nodular fasciitis.

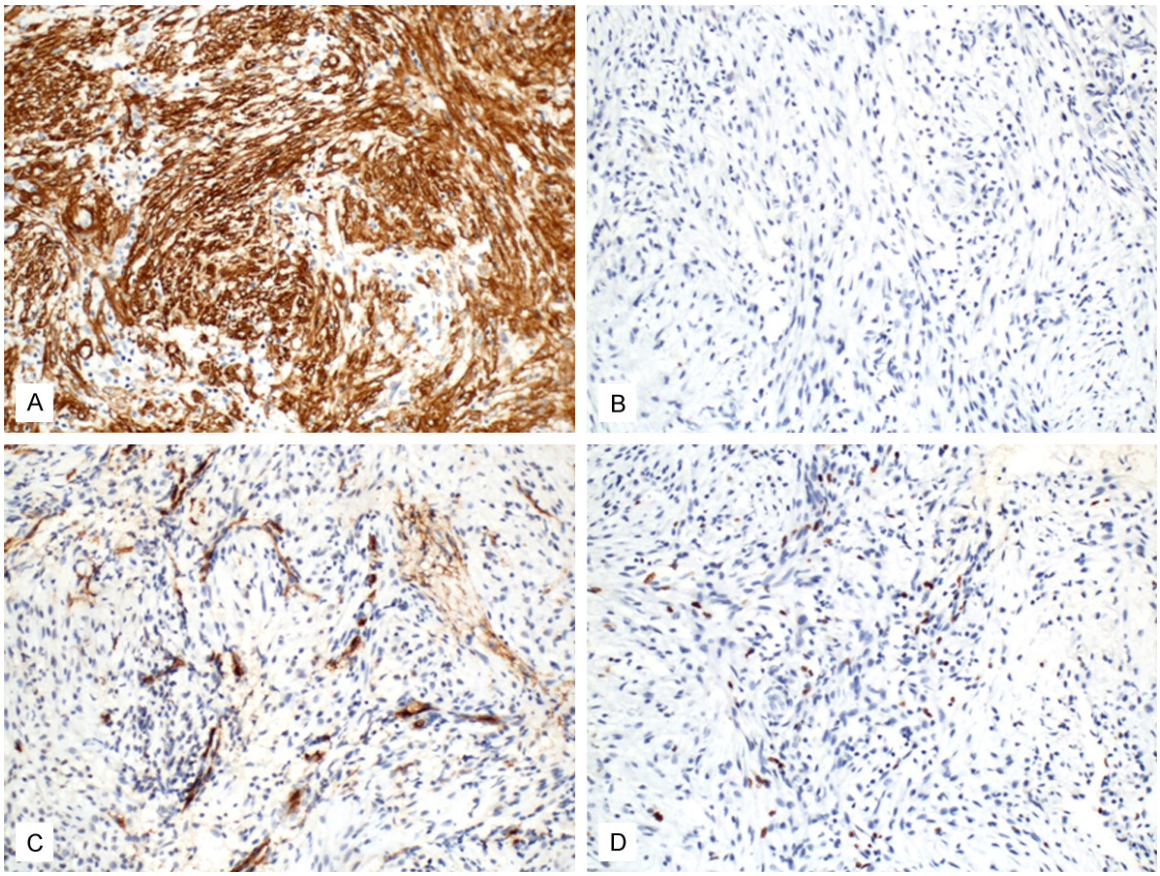

Figure 2. Immunohistochemical staining of the lesion. A. Diffuse and strong expression of SMA could be seen in the spindle cells. B. The spindle cells were negative for CK. C. The spindle cells were negative for CD34. D. Ki67 proliferative index was approximately 10%.

Discussion

Nodular fasciitis is a relatively common lesion, which is considered a self-limiting disease. Nodular fasciitis can occur in soft tissues and various organs including parotid gland, bladder [2, 3]. Breast location is very exceptional, and about 33 cases are reported [4]. As the most common primary neoplasms in the breast were fibroadenoma and invasive cancer, the correct diagnosis of nodular fasciitis may be a hard work.

Histologically, nodular fasciitis is characterized by plump fibroblastic/myofibroblastic cells arranged in short fascicles. Usually, the tumor cells are quite bland, and show light to moderate atypia. Infrequently, the scattered multinucleated osteoclast-like giant cells and lymphocytes may be present within the tumor cells. Our reported case show extensive spindle cells change with scattered osteoclast-like giant cells and lymphocytes. Histologically, the tumor was predominately composed of sheets of atypical spindle cells and scattered osteoclast-like giant cells and lymphocytes. To date, the reported case with osteoclast-like giant cells is exceptional rare [5]. So the significance of osteoclast-like giant cells is still unclear. The osteoclast-like giant cells were simply immunopositive for CD68, indicating these cells may be only reactive cells. So, we firstly thought it might be a tumor complicated with inflammatory cells such as inflammatory myofibroblastic tumor. The presence of classic spindle cells with pale eosinophilic cytoplasm and plump vesicular nuclei and the positive of expression SMA can usually favor the correct diagnosis. Without the prominent admixed plasma cells infiltrate can usually rule out inflammatory myofibroblastic tumor. However, if the specimen is limited or from fine-needle aspiration, and histologically lacks the classic histological structure, the correct diagnosis may be a great challenge, as it is usually difficult for pathologists to think about the possibility of nodular fasciitis.

In addition, the differential diagnosis also includes some other benign and malignant tumors which can possess spindle cells, such as: fibromatosis, low-grade spindle-cell metaplastic carcinomas, especially fibromatosis-like and reactive spindle-cell nodules after biopsy [6-9]. Based on the classic histologic structure and immunostaining, the correct diagnosis can be made. Moreover, some sarcomatoid carcinomas can present as extensive spindle cells with osteoclast-like giant cells. Thus, low-grade sarcomatoid carcinoma is also an important differential diagnosis [10]. It is essential for using a panel of antibodies to make the correct diagnosis.

According to Stanley MW et al. [11], the majority of breast nodular fasciitis have a relatively better clinical course than inflammatory myofibroblastic tumor. Nodular fasciitis regress spontaneously. Local recurrence is very infrequent. Inflammatory myofibroblastic tumor is benign with a local recurrence rate of 10-25%, depending on anatomical location. In our case, because of the extensive presence of atypical spindle cells and scattered multinucleated osteoclast-like giant cells and lymphocytes, we diagnosed it as a breast nodular fasciitis.

Conclusion

Breast nodular fasciitis is a rare lesion that mimics breast inflammatory myofibroblastic tumor. Our reported case was predominantly made up of abundant spindle cells and scattered osteoclast-like giant cells and lymphocytes. The unusual histological appearance may pose a great diagnostic challenge, especially if the specimen is limited or from fine-needle aspiration.

Acknowledgements

This work was supported by the Program for Liaoning Innovative Research Team in University (No: LC2015029), the Natural Science Foundation of Liaoning Province of China (No: L2015598), and the Program of Science and Technology Department of Liaoning Province (No. 2013225021).

Disclosure of conflict of interest

None.

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