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Case Report

Nodular fasciitis in male breast- A case report

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ABSTRACT

Nodular fasciitis of the breast is a particularly rare manifestation of this uncommon benign mesenchymal proliferation, which primarily affects soft tissues, with a predilection for the upper extremities. Arising from fibroblastic hyperplasia, nodular fasciitis in the breast presents a diagnostic conundrum due to its ability to mimic other benign and malignant breast lesions. This study investigates the clinical presentation, diagnostic workup, and potential treatment modalities for nodular fasciitis. We present a rare case of a 38-year-old male patient who presented with a rapidly growing painless mass in his right breast. Upon clinical examination, a well-circumscribed, firm, mobile mass was identified. Ultrasonography revealed a hypoechoic lesion with a well-defined margin and posterior acoustic enhancement. Given the equivocal imaging findings, an excision biopsy was performed. Histopathological examination including immunohistochemistry confirmed the diagnosis of nodular fasciitis. Thus, the case highlights the importance of maintaining a high index of suspicion for nodular fasciitis, particularly within the differential diagnosis for male breast masses like fibroadenoma and phyllodes tumors. Inclusion of this entity is essential to minimize unnecessary and potentially morbid surgical interventions

1. Introduction

Nodular fasciitis is a pseudosarcomatous myofibroblastic proliferation usually preceded by a history of trauma affecting patients of all ages. While nodular fasciitis is an uncommon presentation in the male breast, its ability to mimic both benign and malignant lesions can pose a significant diagnostic hurdle.[1] This report details a rare case of nodular fasciitis involving the breast parenchyma in a middle-aged male patient. The classic histomorphological features and immunohistochemical analysis were instrumental in establishing the definitive diagnosis.[2]

2. Case Report

A 38-year-old male presented to the outpatient surgical clinic with a recent history of a rapidly enlarging, painless mass in his right breast. Physical examination revealed a firm, mobile nodule measuring 4.0 x 2.5 cm in the upper inner quadrant. The nodule was freely mobile and not adherent to deeper structures or the overlying skin. No palpable lymphadenopathy was detected in the axillary or supraclavicular regions. The patient denied any history of prior trauma to the area.

Given the clinical presentation, radiological investigations were recommended. Mammography demonstrated a high-density, ellipsoidal solid mass with irregular margins in the right breast, devoid of associated calcifications. Subsequent ultrasound examination revealed

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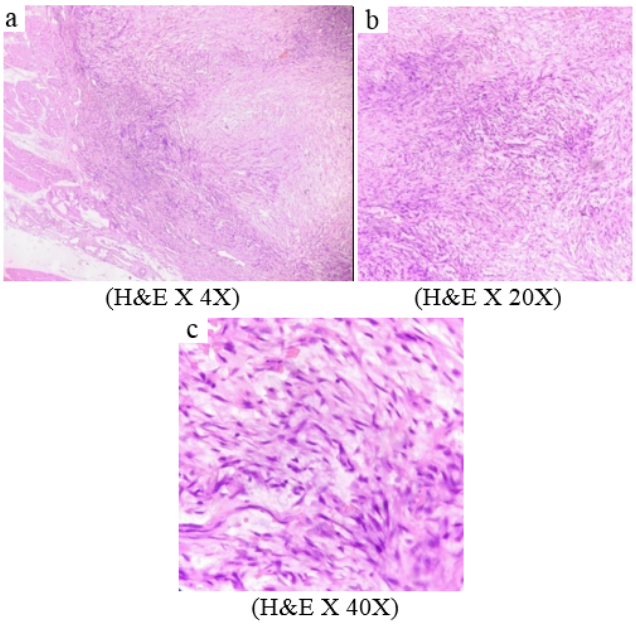

Figure 1: Sections examined show spindle cell neoplasm arranged in fascicles and focal storiform pattern. The tumor cells are bland spindle to stellate shaped with fine chromatin, small nucleoli at places and moderate amount of cytoplasm and mitoses 3-5/10 HPF.

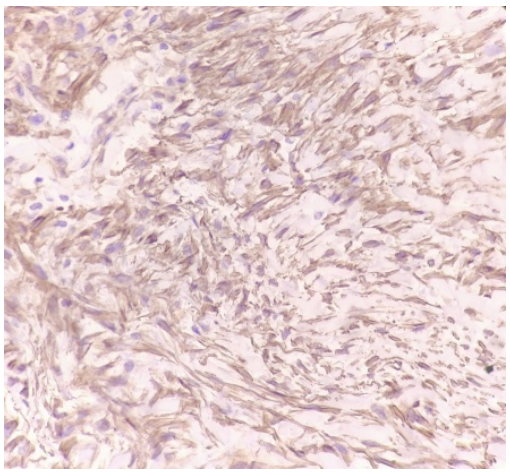

Figure 2: 40x IHC: SMA - Immunoreactive

an oval hypoechoic lesion measuring 35×30×25 mm in the same location as the mammographic abnormality. The sonographic features included ill-defined margins with internal echogenic foci and a surrounding hyperechoic rim. Fine Needle Aspiration Cytology (FNAC) of the swelling revealed predominantly blood along with few inflammatory cells only. Due to the indeterminate nature of the findings on both imaging and cytopathology , an excisional biopsy of the mass was advised.

The excised specimen was sent for histopathological examination. Grossly, a friable irregular grey white, firm,

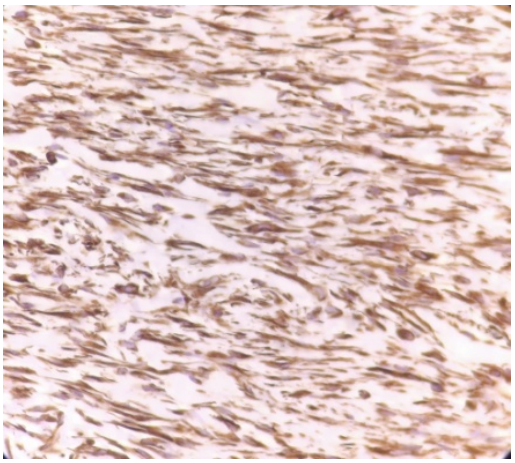

Figure 3: 40x IHC: Vimentin – Immunoreactive

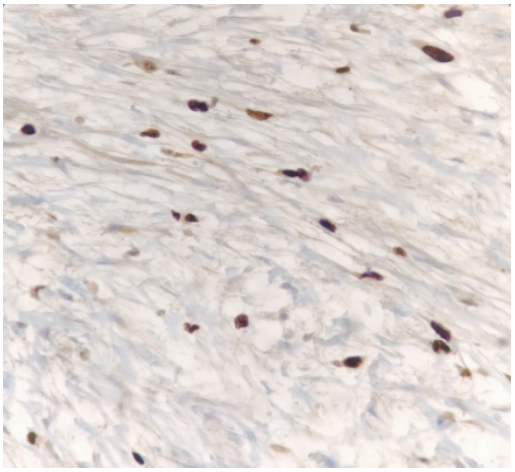

Figure 4: 40x IHC:Ki67- 8-12%

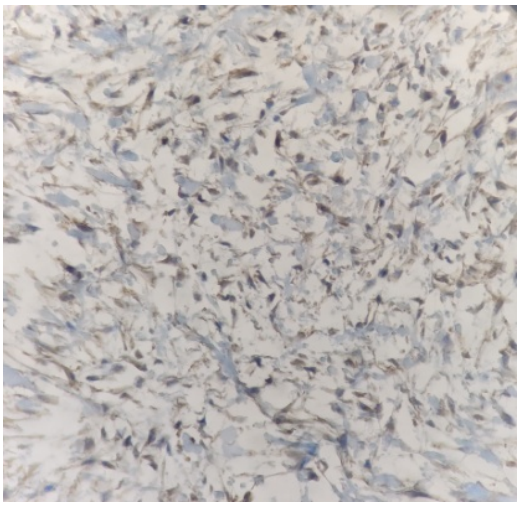

Figure 5: Beta-catenin-cytoplasmic expression, focal nuclear

nodular tissue piece measuring 3.5 x 3 x 2.6 cm was received. Cut surface revealed homogenous grey brown areas.

Microscopic examination revealed a spindle cell neoplasm arranged in fascicles and focal storiform pattern with few multinucleate cells in the periphery of the lesion. The tumor cells were bland, spindle to stellate in shape with fine chromatin, inconspicuous nucleoli and moderate amount of cytoplasm infiltrating into the peripheral skeletal muscle. Mitotic rate was 3-5/10 HPF. No epithelial component noted.

A panel of immunohistochemical stains was applied which revealed immunopositivity for Vimentin, Smooth muscle actin and Beta-catenin. CD 68 positivity was observed in few interspersed cells. CK, CD 34, desmin, H-caldesmon and S100 were immunonegative. Proliferation index assessed using Ki67 was 8-12%.(Figures 1, 2, 3, 4 and 5)

3. Discussion

As per WHO classification of soft tissue tumors, nodular fasciitis is categorized under fibroblastic and myofibroblastic tumors and is defined as a self limiting mesenchymal neoplasm that usually occurs in subcutaneous tissue. This condition typically manifests in soft tissues and is most prevalent in young adults with a peak between 20-40 years of age. Earlier considered to be a reactive lesion, due to a history of trauma in 10%-50% of cases, has been now proved to harbor a clonal proliferation of t(17:22) translocation that produces a MYH9-USP6 fusion.[3] The most common sites affected by nodular fasciitis include upper extremities, especially the flexor aspect of forearm, trunk, neck, but this lesion can occur in any anatomical location.[1] Nodular fasciitis is rarely found in breast. As per literature, the incidence ratio of nodular fasciitis between males and females is 1:1. While the majority of nodular fasciitis lesions are found within superficial fascial layers, they can occasionally involve deeper structures including muscles, tendons, blood vessels, nerve sheaths, and the periosteum (bone lining). The typical size of these lesions ranges from 1 to 3 centimeters, with rare instances exceeding 5 centimeters.[4] Nodular fasciitis is a mimicker of breast cancer both clinically and radiologically. Therefore, for an accurate diagnosis of this entity nodular fasciitis, histopathological examination along with immunohistochemical staining is mandatory.[5]

Histologically, nodular fasciitis is composed of plump, immature-appearing fibroblasts and myofibroblasts containing elongated nuclei with punctate nucleoli. Mitoses are frequent, but atypical forms are notably absent. Transitions from hypercellular regions with myxoid stroma to hypocellular areas with fibrous stroma termed as zonation are frequently observed. Storiform or fascicular patterns are common in cellular areas. Metaplastic bone, cystic areas, ganglion-like cells, prominent vessels, extravasated red cells, and infiltrating lymphocytes are common.[6]

It is to be noted that the high cellularity of the lesion and the presence of numerous mitotic figures are responsible for the frequent confusion of this lesion with a sarcoma. However, the constituent cells lack nuclear hyperchromasia, a critical feature in distinguishing a reactive process from a sarcoma. The other common differentials to be ruled out in male breast include fibromatosis, myxoid sarcoma, myofibroma, phyllodes tumor and myofibroblastoma. The differential diagnosis for nodular fasciitis in the breast can be complex due to the presence of other spindle cell lesions, encompassing both benign and malignant types. Examples include pseudoangiomatous stromal hyperplasia and spindle cell metaplastic carcinoma.[7–9]

Immunohistochemical staining techniques are critical for the accurate evaluation of this diverse group of spindle cell lesions. The basic panel for spindle cell neoplasm includes CK, Vimentin, SMA, CD34, Desmin, Caldesmon and S-100. In case of nodular fasciitis, positive stains includes smooth muscle actin, muscle specific actin and calponin whereas negative stains includes desmin, h-caldesmon, S100, SOX10, CD34, ERG, epithelial membrane antigen and cytokeratin. In our case, cells showed positivity for Vimentin and smooth muscle actin and negative immunostains were noted for CD 34, desmin, H- caldesmon and S100 confirming the diagnosis.

The management depends on several factors like age of patient, symptoms, size and location of the lesion. The treatment for nodular fasciitis is individualized based on the specific circumstances. Observation, surgical excision and minimally invasive techniques are the main options. The conservative management or excisional biopsy remains the treatment of choice for nodular fasciitis of breast.

4. Conclusion

This report presents a rare instance of nodular fasciitis within the male breast. For patients undergoing core needle biopsies or surgical excisions of breast lesions exhibiting spindle cell morphology, nodular fasciitis should be included prominently within the differential diagnosis. Enhanced recognition of nodular fasciitis as a potential presentation in the male breast can significantly reduce the risk of misdiagnosis and the associated potential for overtly aggressive treatment regimens.

5. Source of Funding

None.

6. Conflict of Interest

None.

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