Hyaline Globules in Mammary Myofibroblastoma: A Case Report

Ugur Ozerdem, MD¹, Justin Wells, MD¹, and Syed A. Hoda, MD¹

Abstract
A 52-year-old otherwise healthy woman presented with a solitary firm mass in the right breast. Histopathological evaluation of the 1.5-cm mass showed a mammary myofibroblastoma of the conventional spindle-cell type. High-power examination of hematoxylin–eosin-stained sections showed round, eosinophilic, intracytoplasmic, as well as extracellular, hyaline globules. These 5- to 20-µm globules appeared gray with a pinkish rim on Masson’s trichrome stain. Immunohistochemically, the hyaline globules were strongly reactive with smooth muscle myosin heavy chain, desmin, and caldesmon. Histologically similar inclusion bodies have been reported in phyllodes tumors—including those with myoid differentiation. To our knowledge, this is the first description of hyaline globules, a peculiar histological curiosity with no known clinical significance, in mammary myofibroblastoma.

Keywords
breast, hyaline globule, inclusion bodies, myofibroblastoma

Case Report
A 52-year-old woman presented with a painless, palpable, solitary, firm, and mobile mass in the right breast. Excisional biopsy revealed a round 1.5-cm tan-yellow lobulated mass that appeared homogeneous and bulging on serial sectioning. Histologically, the tumor comprised of bundles of spindle cells arranged in clusters arranged in short fascicles, without a clearly discernible pattern. The fascicles were separated by bands of hyalinized collagen (Figure 1A). The spindle cells showed vesicular, focally vacuolated (blister-like) nucleus with inconspicuous nucleolus. Mitoses were not identified. Unremarkable adipocytes were dispersed individually, and in small groups, throughout the tumor. No breast glandular epithelium was identified within the tumor. The lesional spindle cells were diffusely immunoreactive for CD34 (Figure 1B), smooth muscle actin, caldesmon, desmin, and smooth muscle myosin heavy chain.

High-power microscopic examination of hematoxylin–eosin (H&E)-stained sections showed numerous round, eosinophilic 5- to 20-µm hyaline globules (HGs), which were mainly located in the (extracellular) stroma (Figure 1C and D, arrows). A few HGs were located in a perinuclear location within the lesional cells. HGs at both locations appeared globular, and stained eosinophilic on H&E stain and stained ground glass-gray (with a pinkish rim) on Masson’s trichrome stain (Figure 1E). Immunohistochemically, the HGs were strongly immunoreactive for smooth muscle myosin heavy chain (Figure 1F), desmin (Figure 1G), and caldesmon (Figure 1H).

The patient was well without evidence of residual disease at last follow-up—6 months after it had been completely excised.

Discussion
The bland spindle cell neoplasm—with seemingly patternless fascicles of spindle cells with intervening collagen bundles and scattered adipocytes—described in this report was characteristic of myofibroblastoma. Immunoreactivity of lesional cells for CD34, smooth muscle actin, caldesmon, desmin, and smooth muscle myosin heavy chain supported their myofibroblastic differentiation.

It may be notable that myofibroblastomas share immunophenotypic signatures with immature vascular smooth muscle cells/pericytes, which express alpha isoform of smooth muscle actin, caldesmon, desmin, and smooth muscle myosin heavy chain,¹ ³ and also with a subpopulation of

¹Weill Cornell Medical College, New York, NY, USA

Corresponding Author:
Syed Hoda, Weill Cornell Medical College, Pathology, 525 E 68th Street, Starr 1031C, New York, NY 10065, USA.
Email: sahoda@med.cornell.edu
mesenchymal stem cells, which express CD34 and pericytic markers.4 These pericytic progenitor cells have also been reported to differentiate into adipocytes.4-6 The aforementioned observations regarding immunophenotypic signatures and adipocytic differentiation in myofibroblastomas may be of interest to those interested in the histogenesis and patterns of differentiation of this benign neoplasm.

Numerous HGs were identified in the case being reported. This finding, to our knowledge, has not been previously published. However, the presence of cytologically and immunohistochemically similar intracytoplasmic inclusion bodies (IB) have been reported in phylloides tumors of breast.7-9 HGs encountered in this case were morphological similar to the IBs reported in fibroepithelial tumors. Both HGs and IBs were globular and appeared eosinophilic on H&E and were immunoreactive for desmin and smooth muscle myosin. Some differences between HGs and IBs are noteworthy. On Masson’s trichrome, HGs of myofibroblastoma appeared gray and ground-glass with pinkish rim, whereas IBs of phylloides tumors appeared red. Furthermore, the HGs in the myofibroblastoma were mostly extracellular, whereas IBs of phylloides tumors were mostly intracytoplasmic.7-9 We have chosen to refer to the structures in myofibroblastoma as HGs, since these were mostly extracellular, and thus, cannot be regarded as intracellular “inclusions.” It has been postulated that IBs in phylloides tumors form as a consequence of deranged metabolism of proliferating stromal cells that result in aggregation of proteins, which manifest as IBs. The same postulate may be applied to the current case—albeit with aggregation of proteins somehow occurring outside of the lesional cells.

Based on evidence, available to date, IBs (and HGs) do not seem to confer any prognostic significance on mammmary lesions. The only importance of these histological “curiosities” seems to be in their ability to kindle the interest of pathologists who then seek consultative opinion—as evident from such cases, rare as they are, ending up in our consultation files.

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