Report of an angiosarcoma mimic: cutaneous aneurysmal fibrous histiocytoma

Case report

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Cutaneous fibrous histiocytomas belong to a class of benign dermal proliferations of fibrohistiocytic cells, of which there are two common variants, namely fibroblastic and histiocytic. A number of other variants have also been described. Ever since the first case series reported in 1981 by Santa Cruz et al. (10) describing this entity, only a few cases of aneurysmal fibrous histiocytoma have been described in the literature (1, 3, 5, 7, 8, 13, 15). Awareness of the clinicopathologic features of this rare entity is required to avoid misdiagnosis as other malignant mesenchymal neoplasms (12).

CASE REPORT

The patient was a 60-year-old male who presented to the dermatology services with a one-year history of a nodule on the back that was progressively increasing in size and had been bleeding for the past week. On examination, a 3 cm exophytic purple vascular papulonodular lesion was noted in the midline of the back. Because of the midline location, extension to the spinal cord could not be ruled out and a spine MRI was performed. MRI indicated that there was no extension to the spinal cord; but incidentally the patient was also found to have syringohydromyelia (at the T6–T7 level) as well as spinal stenosis (at the L3–L4 level). While the patient was reported to have had some pain in the hips for the past 3 years, he did not report any sensory or sphincter derangements, indicating that the lesions were not clinically significant. His past medical history was significant only

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Fig. 1. (A & B). Low power microphotograph of the cellular tumor in the dermis involving the reticular dermis (hematoxylin and eosin, ×40). (C). Typical blood-filled pseudovascular space devoid of endothelial lining (hematoxylin and eosin, ×40). (D). True vascular channel lined by flattened single layer of endothelial cells (hematoxylin and eosin, ×100). (E). Pseudovascular space filled with hemosiderin-laden macrophages and rimmed by giant cells, containing some hemosiderin (hematoxylin and eosin, ×100). (F). Giant cells are seen better at higher magnification and focally line these spaces. In other places, these spaces were seen to be lined by spindle cells of the tumor as well as by foamy histiocytes (hematoxylin and eosin, ×400).
for coronary artery bypass surgery 5 years earlier. A wide excision of the lesion was performed and submitted for histopathologic evaluation.

PATHOLOGIC FINDINGS

Microscopic examination of the lesion showed a cellular and nodular dermal tumor composed of spindle and plump histiocytic-looking cells (Fig. 1A & 1B) admixed with numerous dilated vascular channels that were lined by endothelium but lacked red cells within (Fig. 1D). In addition, there were multiple large, blood-filled spaces without an identifiable endothelial lining (Fig. 1C). Instead, some of these spaces were lined partly by multinucleated giant cells as well as by foamy hemosiderin-rich macrophages (Fig. 1E & 1F). In places, there were dilated spaces totally filled with giant cells and histiocytes. There was no significant necrosis and there were no mitotic figures (less than 1/10 HPF).

Initially, a working diagnosis of low-grade angiosarcoma was made and immunohistochemical studies were performed using an avidin-biotin-peroxidase complex technique. The tissue sections were stained with primary antibodies directed against CD31, CD34, factor VIII (vascular markers) and Ki-67 to assess proliferation. Appropriate positive and negative controls were used for all immunohistochemical stains. CD31 and factor VIII were both positive in the surrounding tumor cells, as well as in the endothelial cells lining the vessels, while CD34 was positive only in the endothelial cells. Ki-67 index was 20% in the cellular areas. With the given morphology, immunostaining profile and a relatively high proliferative index, the initial diagnosis was angiosarcoma.

On review, additional microscopic clues were noted, including the presence of epidermal hyperplasia, a curlicue vascular pattern of fibrohistiocytic dermal proliferation, and vascular proliferation without significant cytologic atypia. While the aforementioned immunostains were noted to outline the stromal vascular component, diagnostic features of angiosarcoma, including cytologic atypia, were not observed. The revised diagnosis was “aneurysmal fibrous histiocytoma”.

DISCUSSION

Tumors of fibro-myo-histiocytic differentiation can be conceptually classified into three major groups: those with cellular/stromal peculiarities (including granular cell, clear cell, myofibroblastic, sclerosing, monster cell, pseudosarcomatous, hemosiderotic, cholesterotic, and myxoid variants); those with architectural peculiarities (deep penetrating, atrophic, aneurysmal (“angiomatoid”), hemangiopericytoma-like, palisading and ossifying variants), and lastly those with both these features (14).

Santa Cruz et al. were the first to describe and propose the term “aneurysmal fibrous histiocytoma” as a special variant of cutaneous fibrous histiocytoma (3). These tumors represent fewer than 2% of all fibrous histiocytomas, and are typically known to occur in the limbs of middle-aged persons. There is a slightly higher recurrence rate (20%) in this variant as compared to other fibrous histiocytomas, a fact that is all the more important with respect to cutaneous aneurysmal fibrous histiocytoma (3, 11). An allied tumor with a similar name is “angiomatoid” fibrous histiocytoma, which is typically located in the subcutaneous tissue. It is described as having a characteristic rimming of lymphoid tissue at the periphery of the lesion. As an ancillary aid to differentiating this entity from aneurysmal fibrous histiocytoma, anecdotal reports of cytogenetic analysis have been presented (2).

Aneurysmal fibrous histiocytoma has the potential for misdiagnosis and the differentials could include malignant melanoma, Kaposi’s sarcoma (12), spindle cell hemangioma, angiosarcoma, and angiomatoid fibrous histiocytoma. The underlying common theme of the aforementioned misdiagnosis entities stems from the fact that there are large blood pools with extravasation of red cells in a spindly and cellular tumor. In what is probably the largest series on aneurysmal fibrous histiocytomas, Calonje et al. explain that larger tissue microhemorrhages due to extravasation of blood cause “slit-like” tissue cracks within those cellular areas of the lesion that have little or no stromal support (3). Bolstering these findings, a more recent report indicated that the loss of factor XIIIa expression in the stromal cells surrounding the blood filled spaces in some way
induces stromal instability that promotes the development of spaces (6). Eventually, these dilated spaces fill up with blood, and continue to enlarge under pressure to finally form typical cavernous or angiomatoid areas (9). The cysts in our case did not demonstrate any squamous lining epithelium, as in the case reported by Sheehan et al. (11).

Angiosarcomas of the skin, on the other hand, can be quite challenging as clinically they can present as a rapidly growing nodule with pain. They develop typically in three kinds of settings: (1) an extremity with lymphedema, secondary to prior mastectomy, in most instances; (2) the face and scalp, in elderly individuals; and (3) skin that has been previously radiated (4). Microscopically, the usual angiosarcoma exhibits obvious dissecting vascular spaces coursing between fibers of the reticular dermis. They possess an endothelium that may vary from bland attenuated to pleomorphic and epitheliod. Whenever there is exuberant proliferation of the endothelial cells, vasoformative features are less evident, and there is often a syncytium of cellular bands composed of fusiform cells or nests, and nodules of distinctly epitheliod cells. Owing to the presence of this latter morphology coupled with seemingly bland cytologic features, initially the tumor in our case was wrongly assigned as an angiosarcoma. Later, the presence of circumscripton and the recognition of the storiform pattern helped reclassify this lesion as an aneurysmal fibrous histiocytoma.

Clinically, aneurysmal fibrous histiocytoma tends to show a higher tendency to recur locally than ordinary fibrous histiocytoma, and incompletely excised histiocytomas have even been reported to be capable of metastatic spread (5). Guillou et al. reported that the risk factors for metastasis include large size, tumor necrosis, repeated local recurrences, high cellularity, aneurysmal changes, marked cellular pleomorphism, and high mitotic activity (5). In their report of cutaneous aneurysmal fibrous histiocytoma, Yang et al. reiterate that due to the presence of hemorrhagic pseudocysts, the extravasation of erythrocytes, and the high vascularity of these tumors, it is important to be able to distinguish this lesion from angiomatoid fibrous histiocytoma and cutaneous malignancies of mesenchymal origin (13).

Fibrous histiocytomas in general may show significant pleomorphism and mitotic activity (7), and these represent potential pitfalls in diagnosis if too much emphasis is placed on the proliferative fraction without paying attention to the morphology, as in our case. It has been suggested that they might be considered low-grade sarcomas despite the benignity of these lesions. Hence, long-term follow-up is required in cases of lymph node metastasis. Our recent case had a nodular lesion at the operative site that was excised, and histopathologic examination only revealed a hypertrophic scar without any evidence of tumor recurrence.

In conclusion, caution and careful clinical/morphologic examination is warranted in the analysis of such cutaneous fibrohistiocytic tumors with a vascular component to avoid the potential for misdiagnosis as malignant vasoformative entities.

REFERENCES
