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CASE REPORT

Angiosarcoma with predominant hobnail cells mimicking hobnail hemangioma

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Abstract

Angiosarcoma is a rare, highly aggressive malignant vascular tumor with a poor prognosis, most frequently involving the skin and superficial soft tissues. Its varied clinical and histopathological presentations often pose significant diagnostic challenges. Hobnail hemangioma, also known as targetoid hemosiderotic hemangioma, is a benign vascular lesion characterized by a biphasic pattern and prominent hobnail endothelial cells. We report a diagnostically challenging case of cutaneous angiosarcoma with predominant hobnail endothelial morphology, closely mimicking hobnail hemangioma both clinically and histologically. A 46-year-old previously healthy male presented with multiple asymptomatic erythematous indurated plaques with surrounding satellite lesions over the scalp for three months. Initial histopathological examination revealed superficial dermal vascular spaces lined by hobnail endothelial cells, suggestive of hobnail hemangioma.

However, due to strong clinical suspicion of malignancy, a repeat biopsy with immunohistochemical analysis was performed. This demonstrated irregular, anastomosing vascular channels, sheets of atypical epithelioid endothelial cells with nuclear pleomorphism, brisk mitotic activity, and cytoplasmic vacuoles containing erythrocytes. Immunohistochemistry showed positivity for CD34 and D2-40, with a high Ki-67 proliferation index (~50%), while melanocytic markers were negative. These findings confirmed the diagnosis of angiosarcoma. This case highlights the importance of clinicopathological correlation and the need for careful evaluation of vascular lesions with hobnail features, as angiosarcoma may closely mimic benign entities such as hobnail hemangioma. Early recognition and appropriate diagnostic workup are crucial to prevent delayed diagnosis and adverse outcomes.

Keywords: cutaneous angiosarcoma; hobnail hemangioma; vascular tumors; scalp tumors

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Introduction

Angiosarcoma is a rare and aggressive malignant neoplasm arising from endothelial cells of blood or lymphatic vessels. It accounts for less than 2% of all soft tissue sarcomas but is associated with a disproportionately high morbidity and mortality due to its aggressive behavior, high recurrence rate, and tendency for early metastasis.[1] Cutaneous angiosarcoma is the most common subtype, frequently involving the scalp and face of elderly individuals, although cases in younger patients have also been reported. Known risk factors include chronic lymphedema, prior radiation exposure, and certain environmental carcinogens; however, many cases arise de novo without identifiable predisposing factors.[1]

Clinically, cutaneous angiosarcoma can present with a wide spectrum of appearances, including bruise-like patches, erythematous plaques, nodules, or ulcerative lesions.[2] This variability often leads to delayed diagnosis, as lesions may initially be mistaken for benign conditions such as ecchymosis, dermatitis, or vascular proliferations.[2]

Hobnail hemangioma, also termed targetoid hemosiderotic hemangioma, is a benign vascular tumor characterized by distinctive histopathological features.[3] These include dilated vascular spaces in the superficial dermis lined by endothelial cells with protruding "hobnail" nuclei and a biphasic growth pattern, often accompanied by hemosiderin deposition.[3] Clinically, these lesions are usually solitary, small, and benign in behavior.[3]

Despite their distinct biological nature, angiosarcoma and hobnail hemangioma may share overlapping histological features, particularly the presence of hobnail endothelial cells. This overlap can lead to diagnostic pitfalls, especially in small or superficial biopsy samples. Differentiating between these entities is critical, as the management and prognosis differ drastically.

In this report, we describe a rare case of cutaneous angiosarcoma with predominant hobnail endothelial morphology, initially mimicking hobnail hemangioma both clinically and histopathologically. This case underscores the importance of maintaining a high index of suspicion and utilizing comprehensive histopathological and immunohistochemical evaluation in atypical vascular lesions.

Case Presentation

A 46-year-old previously healthy male presented with a three-month history of asymptomatic lesions on the scalp. The lesions had gradually increased in size and number but were not associated with pain, bleeding, or systemic symptoms. There was no history of trauma, prior radiation exposure, chronic lymphedema, or significant medical illness.

On physical examination, multiple erythematous, indurated plaques with ill-defined margins were observed over the vertex of the scalp (Figure 1). Several smaller satellite lesions were noted around the main plaques. The lesions were firm on palpation, non-tender, and not associated with ulceration or discharge. Regional lymph nodes were not palpable, and systemic examination was unremarkable.

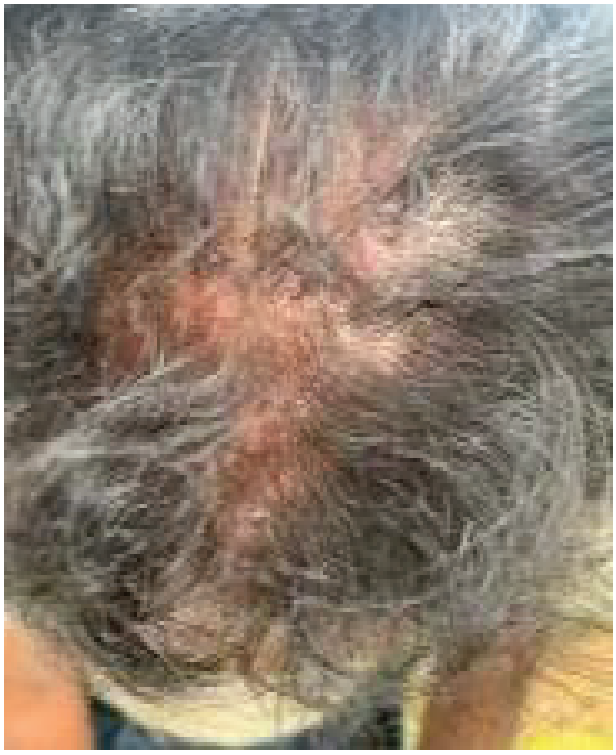


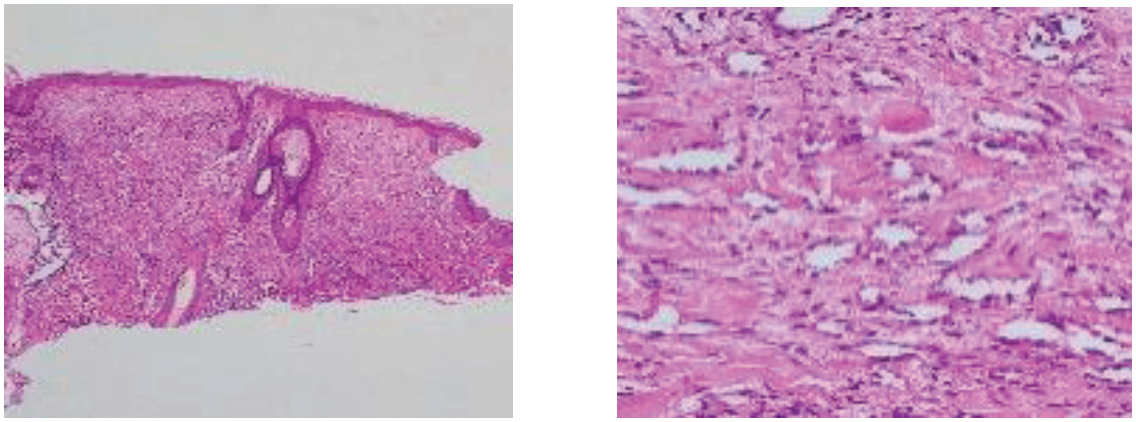
Figure 1. Indurated plaques with ill-defined margins over the vertex of the scalp.

Diagnosis and Management: Given the clinical appearance, a differential diagnosis of vascular tumor, inflammatory dermatosis, or cutaneous malignancy was considered. A punch biopsy of one of the lesions was performed. Histopathological examination of the initial specimen revealed a poorly circumscribed dermal lesion composed of thin-walled, dilated vascular spaces in the superficial dermis. These vascular channels were lined by endothelial cells exhibiting prominent, protruding nuclei, imparting a characteristic hobnail appearance (Figure 2 A, B). The overall morphology suggested a diagnosis of hobnail hemangioma.

However, the clinical presentation, particularly the multiplicity of lesions, induration, and presence of satellite lesions, raised suspicion for a more aggressive pathology, including angiosarcoma. In view of this discrepancy between clinical and histological findings, a repeat, deeper biopsy was obtained for further evaluation, including immunohistochemical studies.

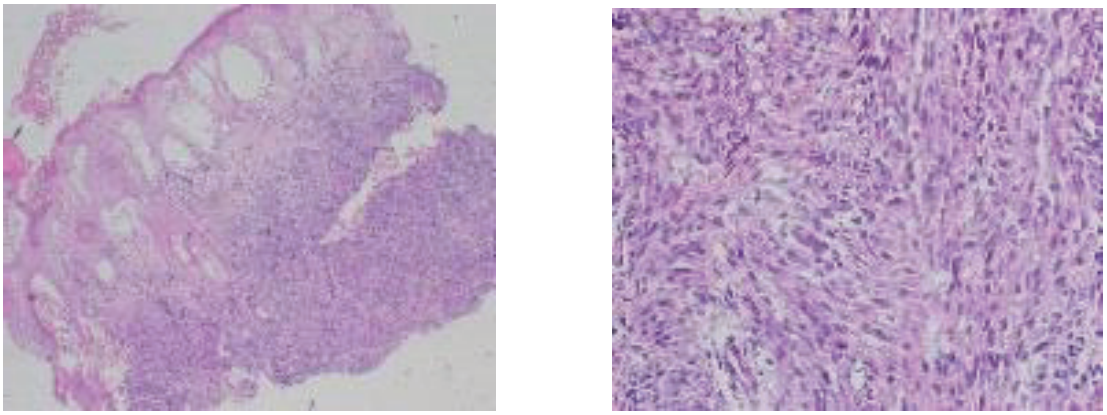
The repeat biopsy demonstrated a more extensive dermal lesion composed of numerous irregular, anastomosing vascular channels infiltrating the dermis. These channels were lined by atypical endothelial cells with plump, hobnail morphology. In addition, there were solid sheets and clusters of epithelioid cells exhibiting marked nuclear atypia, hyperchromasia, and increased mitotic activity. Some of these epithelioid cells showed cytoplasmic vacuolization containing red blood cells, indicative of vasoformative differentiation (Figure 3 A, B).

Immunohistochemical analysis revealed that the tumor cells were strongly positive for CD31 & CD34, confirming endothelial origin. D2-40 positivity suggested lymphatic endothelial differentiation. The proliferation index, as assessed by Ki-67 staining, was markedly elevated at approximately 50%, supporting a diagnosis of a high-grade malignant tumor. Melano-cytic markers, including Melan-A



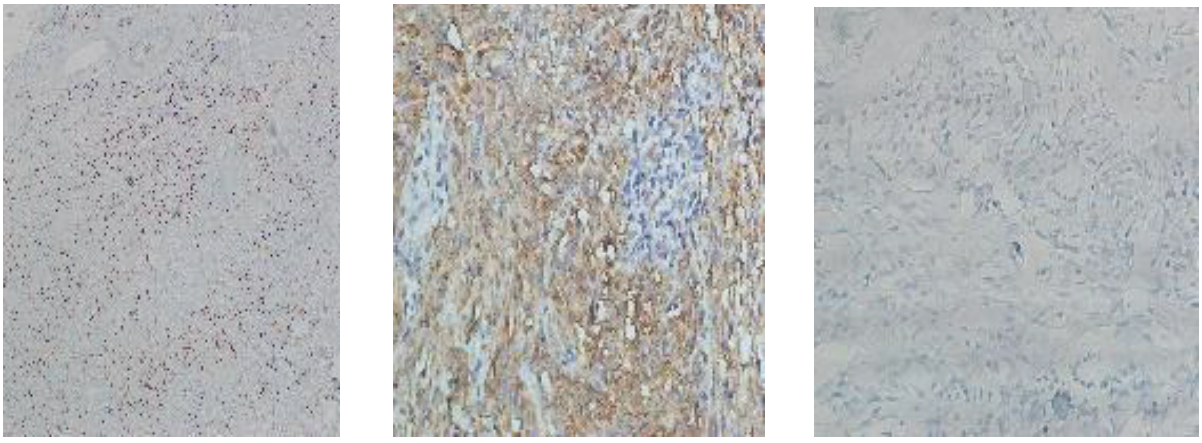
A **B**

Figure 2. H&E stain showing predominant hobnail endothelial cells. (A) ×100 (B) ×400.



A **B**

Figure 3. Deeper biopsy demonstrating features of angiosarcoma. (A) H&E ×100 (B) H&E ×400.



A B C

Figure 4. Immunohistochemistry (A) Ki-67 showing a high proliferation index (×400), (B) CD31 and CD34 positivity (×400), (C) Negative Melan-A staining (×400).

and HMB-45, were negative, effectively excluding melanoma. (Figure 4 A, C).

Based on the combined histopathological and immunohistochemical findings, a definitive diagnosis of cutaneous angiosarcoma was established. The patient was promptly referred to an oncologic surgeon for further management. Cutaneous angiosarcoma is usually managed with wide surgical excision with or without adjuvant radiotherapy, depending on tumor extent and staging. Staging investigations were performed to assess for regional or distant metastasis. Subsequently, the patient underwent multi-stage wide local excision of the lesion with appropriate margins.

Discussion

Angiosarcoma is a diagnostically challenging malignancy due to its diverse clinical and histopathological presentations.[1] The tumor can mimic a variety of benign and malignant conditions, often leading to delays in diagnosis and treatment. Early-stage lesions, in particular, may appear deceptively benign, both clinically and microscopically.

One of the key histopathological features of angiosarcoma is the presence of irregular, anastomosing vascular channels infiltrating the dermis and subcutaneous tissue.[1,4] These channels are lined by atypical endothelial cells exhibiting varying degrees of nuclear pleomorphism, hyperchromasia, and mitotic activity. In poorly differentiated areas, solid sheets of epithelioid or spindle-shaped tumor cells may be present, sometimes with minimal evidence of vascular differentiation.[4]

Hobnail endothelial cells, characterized by protruding nuclei bulging into the vascular lumen, are not exclusive to benign vascular lesions.[6,7] Hobnail endothelial morphology is not restricted to benign lesions such as hobnail hemangioma; it may also be encountered in a spectrum of vascular tumors, including retiform hemangioendothelioma, papillary intralymphatic angioendothelioma, and occasionally angiosarcoma.[8] This overlap can lead to significant diagnostic confusion, particularly in small or superficial biopsy specimens that may not capture the full extent of the lesion.

Hobnail hemangioma is typically a benign, well-circumscribed lesion with a characteristic biphasic pattern.[7] The superficial component consists of dilated vascular spaces lined by hobnail endothelial cells, while the deeper component shows narrower, slit-like vessels.[7] Importantly, these lesions lack significant cytological atypia, mitotic activity, and infiltrative growth.

In contrast, angiosarcoma demonstrates several features that help distinguish it from benign mimickers. These include infiltrative growth into deeper tissues, significant cellular atypia, increased mitotic figures, and a high proliferative index. The presence of solid areas composed of atypical epithelioid cells and evidence of vasoformative activity, such as intracytoplasmic lumina containing erythrocytes, further supports malignancy.

Immunohistochemistry plays a crucial role in confirming the diagnosis.[1,4] Endothelial markers

such as CD31, CD34, and ERG are typically positive in angiosarcoma. D2-40 positivity may indicate lymphatic differentiation.[1,4] However, these markers are not specific for malignancy and can also be expressed in benign vascular lesions. Therefore, the interpretation of immunohistochemical results must be integrated with morphological findings.

The Ki-67 proliferation index is a useful adjunct in differentiating benign from malignant vascular tumors.[5] A high Ki-67 index, as seen in this case, is indicative of increased cellular proliferation and supports a diagnosis of angiosarcoma.

This case highlights the critical importance of clinicopathological correlation. The initial biopsy findings were suggestive of a benign lesion; however, the clinical features raised suspicion for a more aggressive process. The decision to perform a repeat biopsy with deeper sampling and immunohistochemical analysis was instrumental in establishing the correct diagnosis.

Failure to recognize angiosarcoma at an early stage may have serious consequences, given its aggressive nature and poor prognosis. Delayed diagnosis may result in extensive local disease, regional spread, and distant metastasis, significantly limiting treatment options and reducing survival.

Conclusion

Angiosarcoma can closely mimic benign vascular lesions such as hobnail hemangioma, both clinically and histologically. The presence of hobnail endothelial cells should not preclude consideration of malignancy. Careful evaluation of architectural and cytological features, supported by immunohistochemistry and clinical correlation, is essential for accurate diagnosis. Avoidance of superficial biopsies is important to minimize sampling errors. Even when a lesion appears consistent with hobnail hemangioma histologically, exclusion of angiosarcoma is imperative to prevent potentially devastating outcomes.

Ethics statement

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Authors' contribution

SS contributed to patient management, data collection, and manuscript drafting. HJ contributed to the literature review and manuscript editing. CU supervised the study and critically revised the manuscript. RK contributed to histological analysis and interpretation. All authors read and approved the final manuscript.

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