—Case Reports—

Hobnail Hemangioma: A Case Report

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Hobnail hemangioma is a small, solitary, benign vascular tumor that shows a biphasic histological pattern of dilated vascular spaces in the superficial dermis and narrow vascular structures in the deeper dermis. In the superficial dermis, dilated, irregular, thin-walled vascular spaces are lined by plump endothelial cells with large nuclei which protrude into the lumina like hobnails. A 43-year-old Japanese man presented with an 11×8-mm bluish-red macule surrounding a 6×3-mm violaceous, slightly elevated papule of the lumbar region of 6 months' duration. Total resection was performed under local anesthesia. Microscopic examination revealed a biphasic pattern with dilated superficial vessels whose endothelial cells were plump with intraluminal papillary projections, showing a "hobnail" appearance, in the papillary layer and upper dermis, and vascular spaces forming slitlike spaces, some of them dissecting collagen fibers, in the deeper dermis. Neither true atypia nor mitotic figures were present. The findings were consistent with those of hobnail hemangioma. Immunohistochemical analysis of the endothelia of the superficial vessels showed that CD31 and D2-40 were expressed, factor VIII was focally expressed, and CD34 and α-SMA were not expressed. In the endothelia of the deeper vessels, CD31, CD34, factor VIII, and α-SMA were expressed, but D2-40 was not expressed. These findings suggest that hobnail hemangioma also shows a biphasic immunohistochemical pattern because of its origin from both lymphatic vessels and blood vessels. (J Nippon Med Sch 2015; 82: 151–155)

Key words: hobnail hemangioma, targetoid hemosiderotic hemangioma, immunohistochemistry

Introduction

Hobnail hemangioma is a small, solitary, benign vascular tumor usually arising on the trunk or extremities of young or middle-aged persons and characteristically has a biphasic histological pattern of dilated vascular spaces in the superficial dermis and narrow vascular structures in the deeper dermis[1–3]. In the superficial dermis, the neoplasm is composed of dilated, irregular, thin-walled vascular spaces lined by plump endothelial cells with scanty cytoplasm and large nuclei protruding into the vascular lumina like matchsticks or hobnails. In the deeper dermis, narrow, angulated, irregular vascular channels infiltrate and dissect between collagen bundles. Lymphocytic infiltrates, collagen fibrosis, and hemosiderin deposits are also observed. These features vary according to the age of the neoplasm. Cytologic atypia and increased mitotic activity are usually not observed.

In 1988, Santa Cruz and Aronberg[1] described a "targetoid hemosiderotic hemangioma" by reviewing vascular lesions with clinical features of a small, single, annular, targetoid lesion and the above-mentioned histologic findings. A similar hobnail endothelial cell cytomorphology has been observed in other vascular tumors, even in the malignancy. Then, in 1994, Calonje et al.[4] proposed the designation "hobnail hemangioma" for a benign vascular neoplasm with such cytomorphologic features, despite the presence or absence of the clinical aspects of targetoid hemosiderotic hemangioma.

Since the original description of targetoid hemosiderotic hemangioma by Santa Cruz and Aronberg, more than 100 cases of hobnail hemangioma have been published, but, to our knowledge, only 5 case reports

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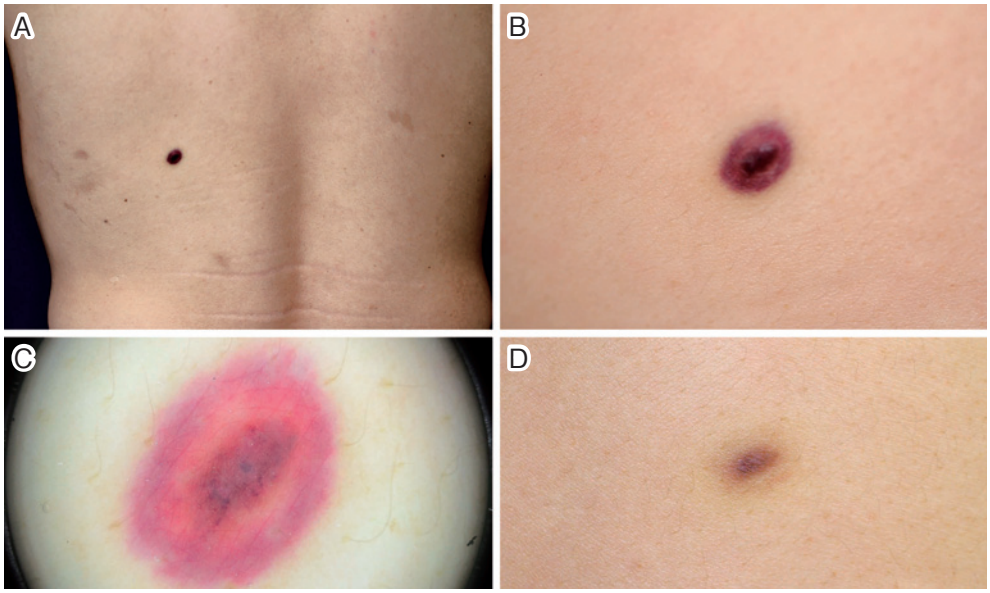

Fig. 1 (a) A bluish-red macule of the left lumbar region of a 43-year-old Japanese man at first visit. (b) Close up of the lesion showing a bluish-red macule surrounding a violaceous, slightly elevated papule. (c) Dermoscopy showing a circumscribed, homogenous red area surrounding a center dark-purple area. (d) The macule and the center papule were duller in color at the time of operation.

have been published in Japan. Herein, we present a 43-year-old man with a hobnail hemangioma, which was subjected to immunohistochemical investigation.

Case

A 43-year-old Japanese man presented with a bluish-red macule that had been present in the lumbar region for 6 months. Because the macule had gradually been enlarging, he came to our institution. He had been well and had no memory of injury to the region. Physical examination revealed an 11×8-mm bluish-red macule surrounding a 6×3-mm violaceous, slightly elevated papule on the left lumbar region (**Fig. 1a and b**). Dermoscopy revealed a circumscribed, homogenous red area surrounding a center dark-purple area (**Fig. 1c**). Four weeks later, the macule and the center papule of the lesion appeared duller in color than when first observed (**Fig. 1d**), and total resection was performed under local anesthesia.

Microscopic examination revealed a biphasic pattern (**Fig. 2a**). Dilated superficial vessels were present in the papillary layer and upper dermis, of which the endothelial cells were plump with intraluminal papillary projections, showing a "hobnail" appearance (**Fig. 2b**). The cytoplasm was scant, and nuclei were large without visible nucleoli. Some of the nuclei showed random hyperchromasia, but neither true atypia nor mitotic figures were present. In the deeper dermis, vascular structures formed slitlike spaces, some of which dissected collagen fibers (**Fig. 2c**). A sparse to moderately dense perivascular lymphocytic infiltration was present. Intense red blood cell extravasation and numerous siderophages were also observed.

Immunohistochemical investigation was performed with antibodies against CD31 (Leica Biosystems, Nussloch, Germany), CD34 (Nichirei Bioscience, Tokyo, Japan), factor VIII (Roche Diagnostics, Basel, Switzerland), α-smooth muscle antigen (SMA) (Dako, Carpinteria, CA, USA), and D2-40 (Dako). The findings (**Fig. 3a–e**) are summarized in **Table 1**. In the endothelial cells of the superficial vessels showing a hobnail appearance, CD31 and D2-40 were expressed, factor VIII was focally expressed, but CD34 and α-SMA were not expressed. In the endothelial cells of the deeper vessels forming slitlike spaces, CD31, CD34, factor VIII, and α-SMA were expressed, but D2-40 was not expressed.

Eleven months after resection, no recurrence or metastasis has been observed.

Discussion

The present case showed a small targetoid lesion with a central violaceous papule and a surrounding halo. Microscopic examination revealed a biphasic pattern. In the papillary dermis dilated vessels were lined by hobnail-appearing endothelial cells with intraluminal papillary

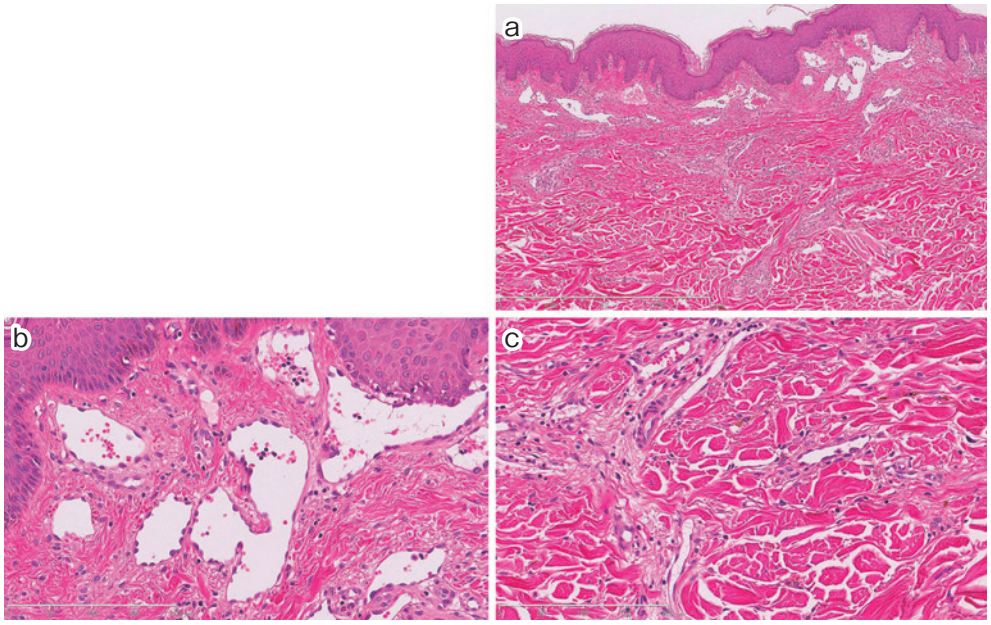

Fig. 2 (a) Microscopic examination revealed a biphasic pattern. (b) In the upper dermis, a number of dilated vessels were present. Their endothelial cells were plump with intraluminal papillary projections, showing a 'hobnail' appearance. (c) In the deeper dermis, vascular spaces formed slitlike spaces. Intense red blood cells extravasation and numerous siderophages were also observed. Hematoxyline and eosin stain.

projections. In the deeper dermis typically slitlike angulated vascular spaces had dissected through collagen bundles. Numerous siderophages and the extravasation of the erythrocytes were also present in the dermis. Therefore, we diagnosed a typical hobnail hemangioma.

Hobnail hemangioma should be distinguished from the other vascular tumors with similar histologic features, such as patch-stage Kaposi's sarcoma, progressive lymphangioma, retiform hemangioendothelioma, and Dabska's tumor[2,3].

In the patch-stage of Kaposi's sarcoma, an increased number of irregular, jagged vessels infiltrate the dermis and separate the collagen bundles. This infiltrative pattern resembles that of hobnail hemangioma in the deeper dermis; however, in hobnail hemangioma, widely dilated vascular spaces are observed in the superficial dermis. Additionally, in contrast to patch-stage Kaposi's sarcoma, which has flat and monolayered vascular spaces, the spaces in hobnail hemangioma are lined by distinctive hobnail endothelial cells. The diagnosis also can be made clinically because of the more extensive multiple lesions of Kaposi's sarcoma, in contrast to a usually solitary lesion of hobnail hemangioma[1–3].

Progressive lymphangioma (benign lymphangioendothelioma) presents a slow-growing, solitary benign tumor with a well-circumscribed erythematous macule or plaque[5]. Microscopic examination shows that the lesions consist of anastomosing, irregular, dilated, thin-walled vascular structures developing predominantly in the superficial dermis. Progressive lymphangioma histologically, on low-power examination, displays a monotonous appearance, in contrast to hobnail hemangioma, which shows a characteristic biphasic growth pattern. Also, hemosiderin deposits or extravasated red blood cells are rarely found in progressive lymphangioma[3].

Retiform hemangioendothelioma is a variant of low-grade angiosarcoma that presents as a slowly growing tumor arising mainly on the extremities of young to middle-aged adults[4]. Recurrences are common, but metastases are rare. Microscopic examination shows elongated, arborizing, thin-walled blood vessels that have diffusely infiltrated the dermis or subcutis. On low-power examination, the tumor resembles normal rete testis. The vascular spaces are lined by a single layer of endothelial cells with a matchstick or hobnail appearance. In contrast to retiform hemangioendothelioma, hobnail hemangioma is circumscribed, unlikely to form a retiform architecture, and its hobnail cytomorphology is observed mainly in the superficial dermis[2,3].

Dabska's tumor (papillary intralymphatic angioendothelioma) is a low-grade malignant tumor that presents a slow-growing, solitary, several-centimeter-sized intradermal nodule[6,7]. Dabska's tumor is locally invasive and has the potential to locally recur but rarely metastasizes to a

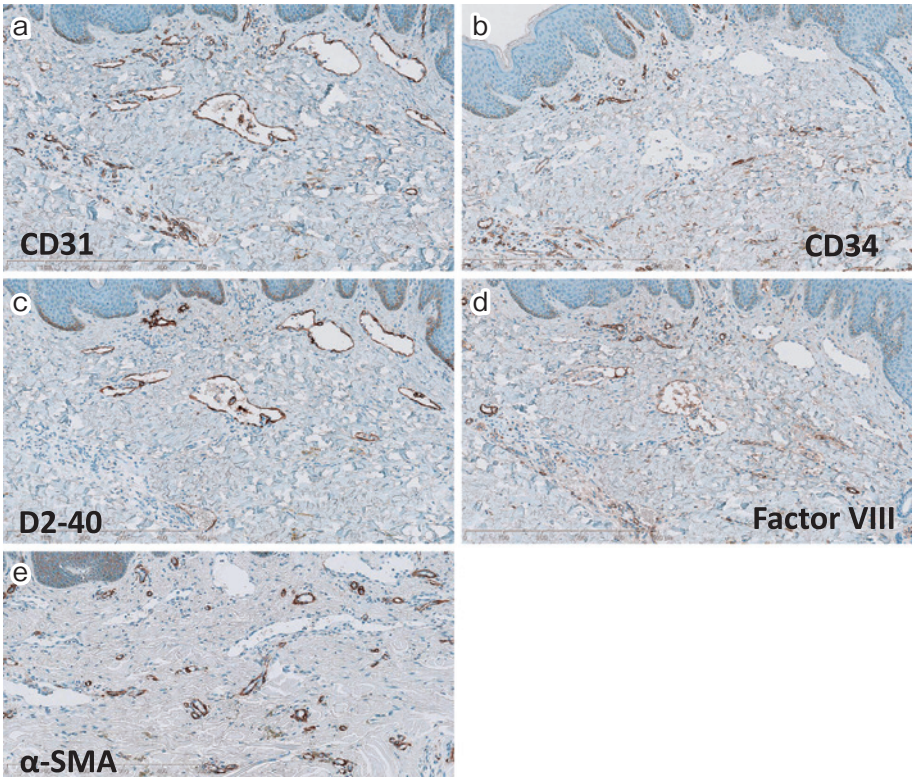

Fig. 3 (a) Positive staining for CD31 in the endothelial cells of the vessels showing a hobnail appearance and in the endothelial cells of the vessels forming slitlike spaces. (b) Positive staining for CD34 in the endothelial cells of the vessels forming slitlike spaces. (c) Positive staining for D2-40 in the endothelial cells of the vessels showing a hobnail appearance. (d) Positive staining for factor VIII in the endothelial cells of the vessels forming slitlike spaces. Factor VIII was focally expressed in the endothelial cells of the vessels showing a hobnail appearance. (e) Positive staining for α-SMA in the endothelial cells of the vessels forming a slitlike space. Immunohistochemistry.

Table 1 Immunohistochemical findings of hobnail hemangioma in the present case

	Superficial vessels showing a hobnail appearance	Deeper vessels forming slitlike spaces
CD31	+	+
CD34	–	+
Factor Ⅷ	+ (focal)	+
α-SMA	–	+
D2-40	+	–

regional lymph node. This tumor usually shows a normal epidermis. The tumor consists of dilated, thin-walled vascular channels, resembling a cavernous lymphangioma, which are lined by bland hobnail endothelial cells and form numerous intravascular papillary projections lined by atypical columnar endothelial cells with central hyalinized cores[7]. In contrast to Dabska's tumor, hobnail hemangioma is more circumscribed and superficially located with less cytologic atypia.

To our knowledge, only 5 case reports of hobnail hemangioma or targetoid hemosiderotic hemangioma have been published in Japan. The small number of reported cases can be attributed to the tumor being overlooked rather than being truly rare. Reasons hobnail hemangioma is often overlooked include the solitary small lesion, its potential for spontaneous regression[1,3], and its pathological resemblance to several other types of hemangioma. Thus, clinicians and pathologists should be

aware of hobnail hemangioma and take account of its clinical and histological features to distinguish the tumor from other hemangiomas.

With respect to the histogenetic origin of the tumor, Santa Cruz and Aronberg[1] suggested that the more angulated vessels resemble to lymphatics in their original report. In 2004, Franke et al.[8] performed a immunohistochemical analysis of hobnail hemangioma with antibodies against D2-40, which is expressed by lymphatic vessel endothelial cells; CD31, which is expressed by blood vessels and lymphatic endothelial cells; CD34, which is highly positive in blood vessels and focally positive in lymphatic epithelium; and α-SMA, which identifies SMA protein. Franke et al. confirmed that D2-40 is expressed only by lymphatic vessel endothelial cells and never by blood vessel endothelial cells. They concluded that hobnail hemangioma was of lymphatic origin because of the strong positivity of neoplastic endothelial cells for D2-40, their negativity for CD34, and the negativity of pericytes for α-SMA.

Upon immunohistochemical analysis of the superficial lesion in the present case, endothelial cells having a hobnail appearance were positive for CD31 and D2-40, focally positive for factor VIII, and negative for CD34 and α-SMA. Factor VIII is reliably expressed by blood vessel endothelium and weakly expressed by only some lymphatic endothelial cells[9]. These findings indicate the superficial part of the tumor is of lymphatic origin and confirm, at least in part, the findings of Franke et al. Furthermore, the endothelial cells of the vessels forming slitlike spaces is likely to be, in our case, of blood vessel origin owing to positivity for CD31, CD34, factor VIII, and α-SMA. These findings suggest that hobnail hemangioma also shows a biphasic immunohistochemical pattern because of its origin from both lymphatic vessels and blood vessels.

Conflict of Interest: The authors have no conflict of interest directly relevant to the content of this article.

References

1. Santa Cruz DJ, Aronberg J: Targetoid hemosiderotic hemangioma. J Acad Dermatol 1988; 19: 550–558.
2. Mentzel T, Partanen TA, Kutzner H: Hobneil hemangioma ("targetoid hemosiderotic hemangioma"): clinicopathologic and immunohistochemical analysis of 62 cases. J Cutan Pathol 1999; 26: 279–286.
3. Guillou L, Calonje E, Speight P, Rosai J, Fletcher C: Hobnail hemangioma: a pseudomalignant vascular lesion with a reappraisal of targetoid hemosiderotic hemangioma. Am J Surg Pathol 1999; 23: 97–105.
4. Calonje E, Fletcher CD, Wilson-Jones E, Rosai J: Retiform hemangioendothelioma: a distinctive form of lowgrade angiosarcoma delineated in a series of 15 cases. Am J Surg Pathol 1994; 18: 115–125.
5. Guillou L, Fletcher CD: Benign lymphangioendothelioma (acquired progressive lymphangioma): a lesion not to be confused with well-differentiated angiosarcoma and patch stage Kaposi's sarcoma: clinicopathologic analysis of aseries. Am J Surg Pathol 2000; 24: 1047–1057.
6. Dabska M: Malignant endovascular papillary angioendothelioma of the skin in childhood: clinicopathologic study of 6 cases. Cancer 1969; 24: 503–510.
7. Schwartz RA, Dabski C, Dabska M: The Dabska tumor: a thirty-year retrospect. Dermatology 2000; 201: 1–5.
8. Franke FE, Steger K, Marks A, Kutzner H, Mentzel T: Hobnail hemangiomas (targetoid hemosiderotic hemangiomas) are true lymphangiomas. J Cutan Pathol 2004; 31: 362–367.
9. Obermair A, Wanner C, Bilgi S, Speiser P, Reisenberger K, Kaider A, Kainz C, Leodolter S, Breitenecker G, Gitsch G: The influence of vascular space involvement on the prognosis of patients with stage IB cervical carcinoma: correlation of results from hematoxylin and eosin staining with results from immunostaining for factor VIII-related antigen. Cancer (Phila.) 1998; 82: 689–696.

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