Skeletal Radiol (1983) 10:165–169

Skeletal Radiology

Histiocytoid Hemangioma of Bone: A Benign Lesion which May Mimic Angiosarcoma

Report of a Case and Review of Literature

Robert O. Cone, M.D.[1], Phillip Hudkins, M.D.[2], Vung Nguyen, M.D.[1], and W.A. Merriwether, MD.[2]

[1] Department of Radiology and
[2] Department of Pathology, The University of Texas Health Science Center at San Antonio, San Antionio, Texas, USA

Abstract. Histiocytoid hemangioma is a related family of endothelial cell neoplasms, which was described by Rosai et al. [14] in 1979 and which encompasses a group of osseous, vascular and cutaneous neoplasms. These neoplasms bear a close resemblance to the angiosarcoma/hemangioendothelioma family of malignant neoplasms. A case of histiocytoid hemangioma is reported that presented as a multicentric osseous lesion and was initially diagnosed as angiosarcoma. The patient has had a remarkably benign course and at a later date developed skin and bone lesions diagnosed as angiolymphoid hyperplasia with eosinophilia identical to the initial lesion. This represents the first reported case of identical osseous and cutaneous lesions of the histiocytoid hemangioma group in the same patient and lends credence to Rosai's concept. A review of the literature concerning angiosarcoma/hemangioendothelioma of the bone is presented with the conclusion that some lesions considered to represent multicentric angiosarcoma may represent the more benign histiocytoid hemangioma.

Key words: Angiosarcoma – Hemangioendothelioma – Histiocytoid hemangioma – Angiolymphoid hyperplasia with eosinophilia

Histiocytoid hemangioma is a descriptive term coined by Rosai et al. [14] to classify a group of related endothelial cell neoplasms characterized by a histologically distinct-appearing population of endothelial cells. These neoplasms arise in the skin, subcutaneous tissue, vessels, heart, and bone and have been described by a variety of terms (Table 1). The bony lesions appear to represent a serious problem in differentiation from the angiosarcoma/hemangioendothelioma group of primary malignant bone neoplasms. This differentiation may be important, as a more benign course seems to characterize the histiocytoid hemangiomas.

Table 1. Conditions reported as related to histiocytoid hemangioma [8, 14]

Site	Term
Skin	Angiolymphoid hyperplasia with eosinophilia, Atypical pyogenic granuloma, Angioblastic lymphoid hyperplasia with eosinophilia
Vessels	Intravenous vascular proliferation, Low-grade angiosarcoma
Heart	Endocardial benign angioreticuloma
Bone	Angioendothelioma, Hemangioendothelioma (some), Low-grade angiosarcoma (some)

We describe a patient with 11 years of follow-up who was initially diagnosed as having primary angiosarcoma of bone with osseous metastases and who subsequently developed additional osseous and skin lesions diagnosed as angiolymphoid hyperplasia with eosinophilia. In retrospect, the subsequent lesions are identical histologically to the initial lesion. This case falls into the Rosai [14] family of histiocytoid hemangioma. We have also reviewed the English-language literature concerning angiosarcoma and hemangioendothelioma of the bone in an effort to identify possible means of differentiating these lesions.

Address reprint requests to: R.O. Cone, M.D., University of Texas Health Science Center at San Antonio, Department of Radiology, 7703 Floyd Curl Drive, San Antonio, TX 78284, USA

Case Report

A 52-year-old black female presented in April 1971 with a 1-month history of gradually increasing pain in her left hip and

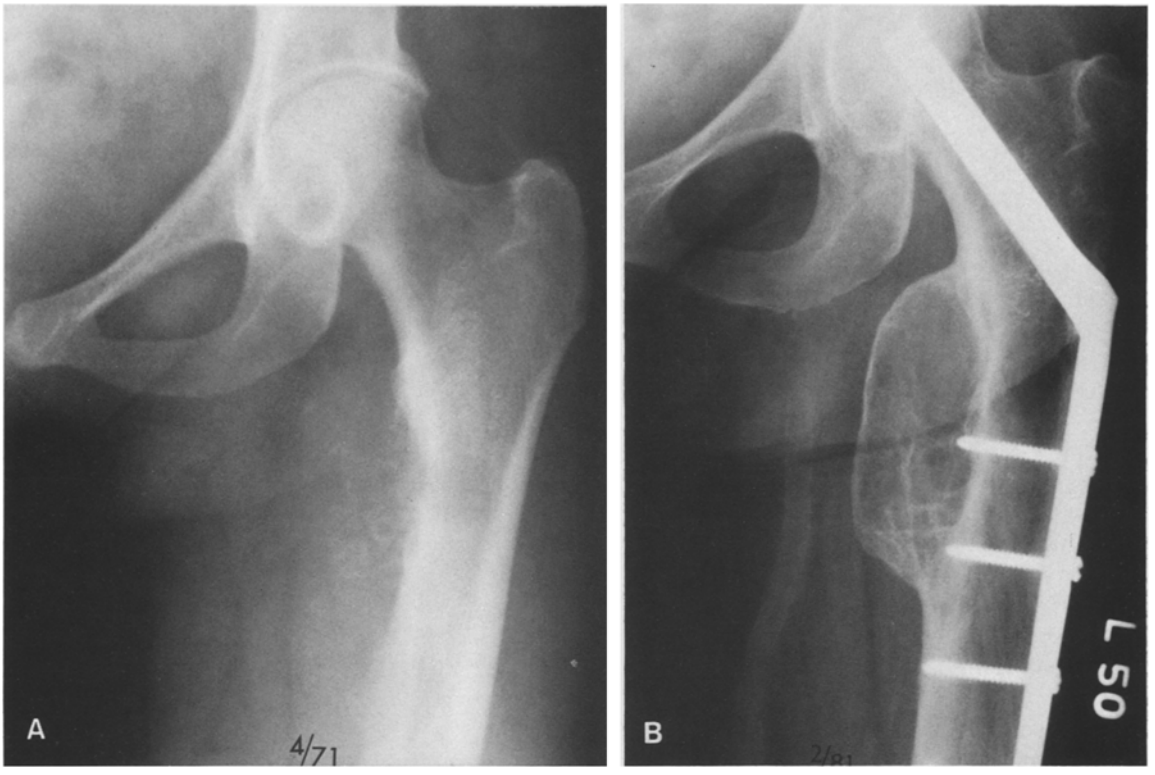

Fig. 1 A, B. Initial roentgenogram from 1971 **A** reveals an aggressive-appearing lesion arising from the medial cortical surface of the left femur. Faint calcifications are present. Follow-up films from 1981 **B** reveal no apparent change in size of the lesion but progressive calcification of the margin and matrix of the tumor

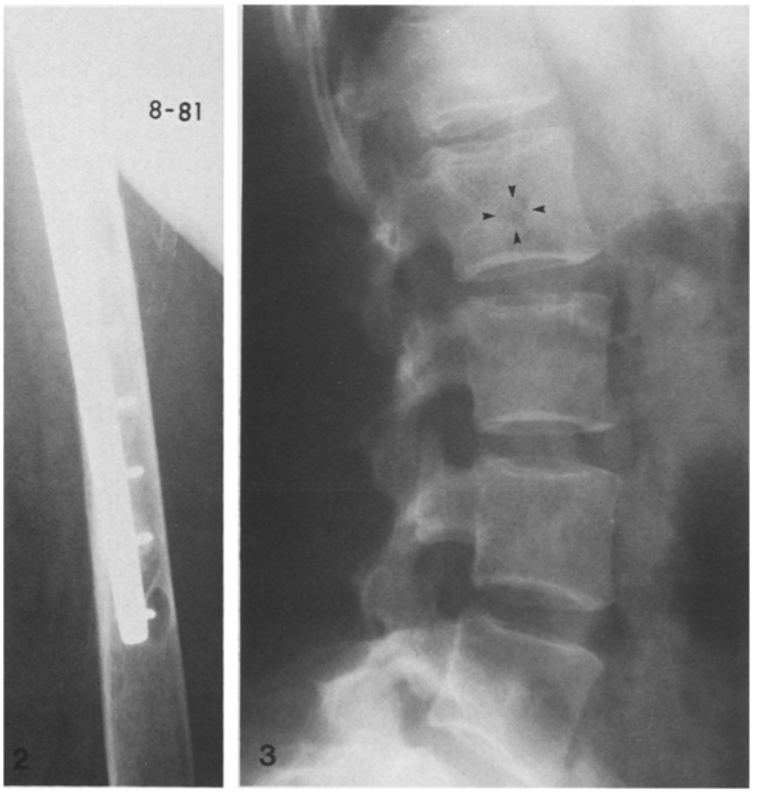

Fig. 2. Study from January 1981 reveals osteolytic lesions in the distal left femur, which showed no significant change in appearance

Fig. 3. Lesion in L2 vertebral body in 1974 showed apparent minimal increase in size

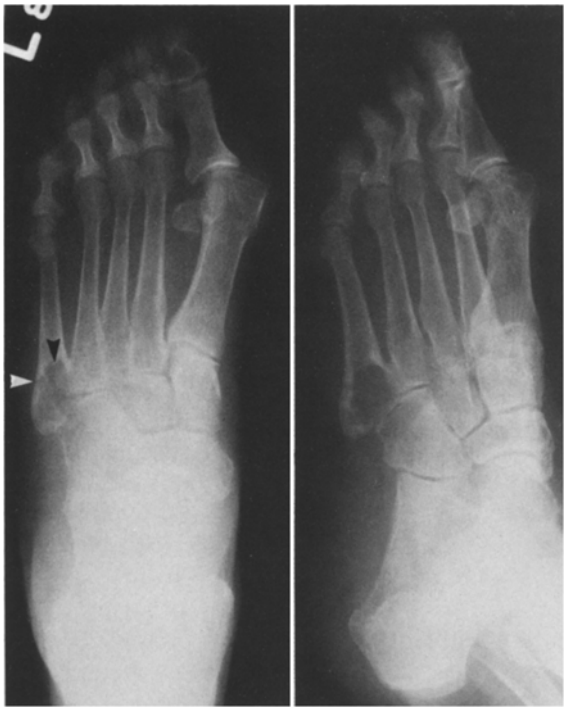

Fig. 4. Osteolytic lesion in the base of the left fifth metatarsal bone with pathologic fracture

thigh, primarily related to ambulation. Roentgenograms revealed a 3×8 cm (Fig. 1A) lesion arising from the proximal left femur with three smaller osteolytic lesions in the distal left femur (Fig. 2). A small lytic lesion in the second lumbar vertebra was also identified (Fig. 3). Open biopsy was interpreted as angiosarcoma of the bone, which was presumed metastatic. The patient was treated with a five-drug chemotherapeutic regimen consisting of 5-fluorouracil, cyclophosphamide (Cytoxan), vincristine (Oncovin), methotrexate, and prednisone. The patient did moderately well, with calcification, but no change in the size of the proximal femoral lesion (Fig. 1B), but continued to complain of chronic pain relating to the left hip.

In March 1973, a small lytic lesion of the left mandible was identified, but no biopsy specimen was taken. In 1974, the lesion of the second lumbar vertebral body was noted to have increased somewhat in size. Numerous laboratory examinations in the interim revealed a relatively constant peripheral eosinophilia (5%–30%) with elevated ESRs (40–60 mm/min) on several occasions. In 1979, the patient began to complain of pain in her left foot. Physical examination revealed two verrucoid lesions on the plantar aspect of her left foot. Roentgenograms revealed a lytic, destructive lesion of the base of the left fifth metatarsal base (Fig. 4). Curettage of the metatarsal lesion and excision of the skin lesion was interpreted as angiolymphoid hyperplasia with eosinophilia. Review of the previous biopsy revealed an identical appearance. Since that time the patient has done well without development of additional lesions.

Pathology

The gross appearance of the initial biopsy specimen from 1971 was red, slightly firm to spongy tissue. Microscopic examination (Fig. 5A) disclosed highly vascular areas composed of proliferating blood vessels alternating with fibrous tissue. The

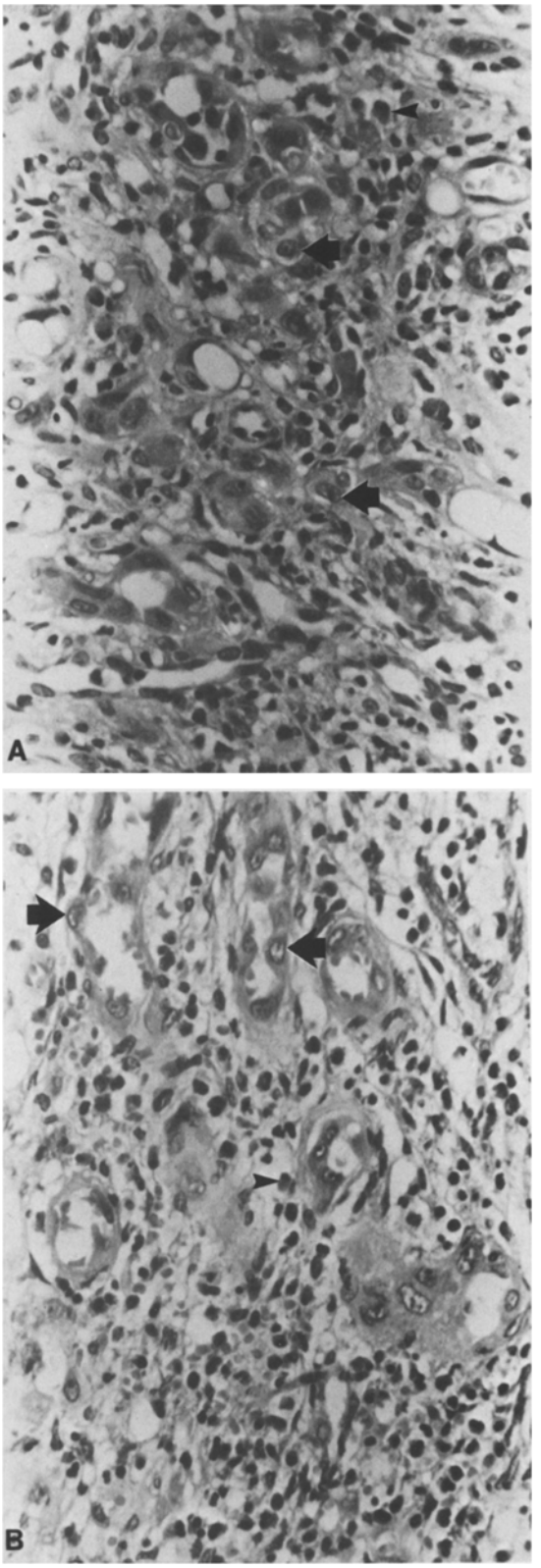

Fig. 5A, B. Biopsy specimens from femoral lesion in 1971 **A** and skin lesion in 1979 **B** demonstrate proliferating vascular elements with plump endothelial cells (*arrows*) as well as numerous eosinophils (*arrowheads*)

blood vessels consisted almost entirely of channels made up of moderately pleomorphic, plump endothelial cells. These endothelial cells projected into the lumen and abutted directly into the intervening intervascular areas. The nuclei of the endothelial cells were vesicular with prominent eosinophilic nucleoli. The cytoplasm was eosinophilic and vacuolated.

The vascular areas were surrounded by a prominent inflammatory infiltrate consisting of eosinophils, lymphocytes, and plasma cells. In some areas the collections of lymphocytes were in follicles. Extravasated red blood cells were admixed in these areas and occasionally could be seen within the lumina of abnormal endothelial channels.

In other areas of the specimen the proliferating endothelial cells were haphazardly arranged, slightly more pleomorphic in appearance, and formed very small irregular vessels and nests with early lumina formation. These areas were involved by the previously described inflammatory infiltrate.

Examination of the skin and bone lesions from the left foot in 1980 revealed an identical pattern to the initial biopsy. Both biopsies were considered to represent the typical appearance of angiolymphoid hyperplasia with eosinophilia.

Discussion

The confusion that exists in classificaton of this disease, angiolymphoid hyperplasia with eosinophilia, relates to the participation and proliferation of the endothelial cell [3, 9]. This endothelial cell proliferation and angiogenic capability is basic to other pathologic processes including Kumura's disease [13], angiosarcoma, and atypical pyogenic granuloma [8].

There are certain criteria basic to each of the above to differentiate them from angiolymphoid hyperplasia with eosinophilia. In Kumura's disease, the patients are usually males, with benign-appearing endothelial cells and associated peripheral eosinophilia. Angiosarcoma is characterized by irregular, anastomosing vascular spaces lined by prominent intravascular budding, anaplastic endothelial cells and foci of necrosis [15]. Histiocytoid hemangioma is the term proposed by the proliferation of a distinctive cell, which they described as a "histiocytoid endothelial cell." Rosai has proposed that angiolymphoid hyperplasia with eosinophilia be considered as an entity within the group of histiocytoid hemangiomas. The term "atypical pyogenic granuloma" has subsequently been argued by some authors to represent angiolymphoid hyperplasia with eosinophilia taking place at different tissue levels [8].

The classification of primary malignant bone tumors of vascular origin has long been controversial. The terms angiosarcoma and hemangioendothelioma are used synonomously by some authors, and differentiated by others on the basis of cellular and vascular element differentiation. Jaffe has suggested that angiosarcomas with prominent vessel formation have a better prognosis. It is interesting to note that several authors have referred to groups of patients presenting with multifocal lesions diagnosed as angiosarcoma/hemangioendothelioma who seemed to have a more benign course than is usually anticipated in these lesions [4–7, 10, 12]. In 1962, Hartman and Stewart [6] reported ten patients with osseous hemangioendothelioma characterized by an indolent course. In 1968, Otis et al. [12], reporting from the same institution, modified the earlier optimism somewhat, but did note that patients presenting with multicentric lesions did seem to have a much better prognosis. In 1965, Bundens, et al. [1] reviewed the literature on angiosarcoma/hemangioendothelioma. Their tabulation also supports a better prognosis with multicentric lesions.

Table 2. Survival in solitary versus multicentric hemangioendothelioma/angiosarcoma

From review of the literature [1, 2, 4–7, 10–12, 14–18]

No. of lesions	45	22
No. surviving but less than 2-year follow-up	2	3
No. surviving 2 years or more	24 (56%)	15 (79%)
No. surviving 5 years or more	12 (28%)	9 (47%)

We reviewed the literature and found 77 reported cases of angiosarcoma/hemangioendothelioma. Of these, 45 were solitary and 22 were multicentric. In comparing the available data on these two groups (Table 2), there does seem to be a much better prognosis for patients presenting with multifocal lesions. We were unable to find any other cases in which angiolymphoid hyperplasia with eosinophilia or its related terms were reported in a patient with a primary vascular tumor of the bone.

We suspect that some of the previously reported cases of multifocal angiosarcoma/hemangioendothelioma of the bone may represent other examples of osseous histiocytoid. Other titles assigned to the histiocytoid hemangioma family are known to be commonly multicentric and tend to be characterized by a relatively indolent course. We believe that the appearance of identical osseous and skin lesions of a histiocytoid hemangioma member provides evidence for the validity of Rosai's concept. To our knowledge, this is the only reported example of histiologically identical osseous and skin lesions in the same patient.

The actual prognosis for osseous histiocytoid hemangioma is not known. However, it is probably better than that for the group of multicentric angiosarcoma/hemangioendotheliomas mentioned previously since, while this group may contain some histiocytoid hemangiomas, it also may be

presumed to contain some metastatic malignant lesions.

It is not possible at this time to characterize the roentgenographic appearance of histiocytoid hemangioma adequately on the basis of so few verified cases. In the few confirmed examples, the lesions have appeared as metaphyseal or epiphyseal poorly marginated osteolytic lesions [14], or as an expansile "soap bubble" lesion. In any event, it is not expected that a distinctive roentgenographic appearance will be forthcoming. It does appear that the possibility of this lesion should be entertained when a multicentric bony lesion is encountered, or when the diagnosis of angiosarcoma/hemangioendothelioma of bone is suggested. In patients with known angiolymphoid hyperplasia with eosinophilia or possibly atypical pyogenic granuloma, bony lesions should be excluded.

References

1. Bundens WD (1965) Malignant hemangioendothelioma of bone: Report of two cases and review of the literature. J Bone Joint Surg [Am] 47:762
2. Carter JH, Dickerson R, Needy C (1956) Angiosarcoma of bone: A review of the literature and presentation of a case. Ann Surg 144:107
3. Castro C, Winkjelmann RK (1974) Angiolymphoid hyperplasia with eosinophilia in the skin. Cancer 34:1696
4. Dorfman HD, Steiner GC, Jaffe HL (1971) Vascular tumors of bone. Hum Pathol 2:349
5. Fienberg R, Baehr FH (1941) Hemangioendothelioma of tibia with metastasis of the popliteal artery. Arch Pathol 31:811
6. Hartmann WH, Stewart FW (1962) Hemangioendothelioma of bone; unusual tumor characterized by indolent course. Cancer 15:846
7. Hauser H (1939) Angiosarcoma of bone. AJR 41:656
8. Lever W (1975) Histopathology of skin, 5th edn. Lippincott, Philadelphia, 613
9. Mehregan AH, Shapiro L (1971) Angiolyphoid hyperplasia with eosinophilia. Arch Dermatol 103:50
10. Morgenstern P, Olivetti RG, Westing SW (1960) Five year cure in a case of malignant hemangioendothelioma of bone treated with Roentgen rays. AJR 83:1083
11. Morgenstern P, Westing SW (1969) Malignant hemangioendothelioma of bone: Fourteen year follow-up in a case treated with radiation alone. Cancer 23:221
12. Otis J, Hutter RVP, Foote FW, Marlove RC, Stewart FW (1968) Hemangioendothelioma of bone. Surg Gynecol Obstet 127:295
13. Reed RJ, Terazakis N (1972) Subcutaneous angioblastic lymphoid hyperplasia with eosinophilia (Kumura's disease). Cancer 29:489
14. Rosai J, Gold J, Landy R (1979) The histiocytoid hemangiomas: A unifying concept embracing several previously described entities of skin, soft tissue, large vessels, bone, and heart. Hum Pathol 10(6):707
15. Steiner GC, Dorfman HD (1972) Ultrastructure of hemangioendothelioma sarcoma of bone. Cancer 29:122
16. Stout AP (1943) Hemangio-endothelioma: A tumor of blood vessels featuring vascular endothelial cells. Ann Surg 118(3):445
17. Sweterlitsch PR, Watts H (1970) Malignant hemangioendothelioma of the cervical spine. J Bone Surg [Am] 52:805
18. Unni KK, Ivins JC, Beabout JW, Dahlin DC (1971) Hemangioma, hemangiopericytoma, and hemangioendothelioma (angiosarcoma) of bone. Cancer 27:1403