We report the clinical and pathological findings in a case of malignant fibrous histiocytoma in the conjunctiva of a 60-year-old man. The patient initially had an atypical limbal lesion, resembling a pterygium, which was excised. Two local recurrences, noted during the following year, were treated by surgical excision followed by cryotherapy. Histopathologic examination of the conjunctival lesions showed a stromal neoplastic infiltrate composed of atypical spindle cells and histiocytelike cells. The immunohistochemical and ultrastructural studies suggested that the tumor was composed of various cellular elements: fibroblasts, myofibroblasts, and histiocytes.

Fibrous histiocytoma is a mesenchymal neoplasm involving predominantly the skin and soft tissues with occasional occurrence in parenchymal organs. Benign fibrous histiocytoma may involve the various ocular adnexa and has been reported in the orbit, tarsus, episclera (including conjunctiva), and eyelid. Malignant fibrous histiocytoma (MFH) has been well described clinically and pathologically in the orbit but rarely reported as a primary conjunctival tumor. This report describes the clinical, histological, immunohistochemical, and ultrastructural features of a recurrent conjunctival MFH in a 60-year-old man.

A 60-year-old man complained of itching in his right eye. His visual acuity was 20/25 OU. Slitlamp examination showed a small (<1 mm) fleshy mass involving the nasal limbus of his right eye. The clinical findings were suggestive of pterygium and the patient was treated with artificial tears. Nine months later the limbal lesion had increased in size (2 × 4 mm) and it was excised. The histopathologic findings were suggestive of fibrous histiocytoma, probably malignant. Four months later the patient was seen with a firm, pinkish nodule (6 mm) involving his right caruncle (Figure 1). The lesion was excised, followed by cryotherapy. Histological examination revealed an MFH. Six months later the patient was seen with a fleshy limbal lesion at the same site from which the first lesion was excised (Figure 2). The lesion was excised and cryotherapy was performed. Histological examination confirmed the diagnosis of MFH with involvement of the deep and corneal margins. Two months later, the patient was seen with a fleshy nodule (2 × 4 mm) on the nasal bulbar conjunctiva of his right eye. This lesion was excised and histological examination revealed a pyogenic granuloma. One year later, there was no evidence of recurrence.

Histopathologic examination of the primary limbal lesion (first surgery) revealed a poorly circumscribed subepithelial neoplasm composed of bundles of neoplastic cells exhibiting a storiform pattern of growth (Figure 3). The neoplastic cells were predominantly spindle-shaped with occasional large, round or ovoid histiocytelike cells. There was moderate mitotic activity. The overlying conjunctival epithelium was unremarkable. The immunohistochemical study showed strong positivity of the neoplastic cells for vimentin. Some spindle cells were positive for smooth muscle actin. The histiocytelike cells were immunoreactive for CD68. Microscopic examination of the caruncular lesion showed similar features although there were more numerous large histiocytelike cells often containing multiple nuclei (Figure 4). Mitotic activity was intense (Figure 4). Approximately half of the spindle-shaped cells were positive for smooth muscle actin (Figure 5, top). The histiocytelike cells were immunoreactive for CD68.
CD68 (KP-1) (Figure 5, bottom) and α1-antichymotrypsin in a proportion of approximately 30% and 50%, respectively. All the neoplastic elements were negative for cytokeratin (AE1/AE3), EMA (epithelial membrane antigen), HMB-45, S-100 protein, desmin, and myoglobin. Ultrastructural examination showed a predominance of spindle-shaped cells. Some of these contained a well-developed rough endoplasmic reticulum without dense plaques, features consistent with fibroblasts, and others showed numerous fusiform densities located predominantly in a subplasmalemmal position suggesting myofibroblastic differentiation (Figure 6, top). There were occasional round or ovoid cells containing numerous lysosomes and villouslike projections of the cell surface suggesting histiocytic differentiation (Figure 6, bottom).

**COMMENT**

Malignant fibrous histiocytoma is the most frequent soft tissue sarcoma of the elderly, involving predominantly the extremities and retroperitoneum, but also occurring in other sites including the ocular adnexa. The histological differential diagnosis of MFH includes pleomorphic carcinoma, malignant melanoma, and other sarcomas. The absence of dysplastic changes of the surface epithelium, lack of connection of the latter with the neoplasm, absence of immunoreactivity for epithelial markers, and ultrastructural findings are against a diagnosis of carcinoma. Malignant melanoma, rhabdomyosarcoma, leiomyosarcoma, and liposarcoma were excluded on the basis of immunohistochemical and ultrastructural findings. Cellular elements having the characteristics of fibroblasts, myofibroblasts, and histiocytes can be found, by electron microscopy, in cases of MFH as well as in cases of benign fibrous histiocytoma. The immunohistochemical profile of the neoplastic cells was also in agreement with a fibrohistiocytic tumor composed predominantly of myofibroblasts (positive reactivity to vimentin and smooth muscle actin and negative reactivity to desmin) and histiocytes (positive reactivity to vimentin, CD68 [KP-1], and α1-antichymotrypsin). Binder and colleagues demonstrated the usefulness of the monoclonal antibody CD68 (KP-1) in cases of MFH. Sensitivity of staining for CD68 (KP-1) was 72% in cases of MFH and 0% for other sarcomas.

Benign fibrous histiocytoma may involve the various ocular adnexa but its malignant counterpart has been rarely reported in the conjunc-
tiva, in contrast with orbital MFH, which is a well-characterized entity. McLean et al mentioned that among 1258 tumors of the conjunctiva diagnosed at the Armed Forces Institute of Pathology, Washington, DC, between 1984 and 1989, there were 7 benign fibrous histiocytomas and 1 MFH although no details were given. Only 6 well-documented cases of conjunctival MFH have been reported. Four patients initially had a single mass and the remaining 2 were children with xeroderma pigmentosum and bilateral conjunctival tumors.

It is difficult to assess the prognosis in our case in view of the small number of previously reported cases of conjunctival MFH. In cases of MFH involving the extremities, the recurrence rate is directly related to adequacy of the surgical therapy. In our patient, we can expect local recurrences since the surgical margins of the recurrent limbal lesion showed sarcomatous involvement. Of the 6 previously described patients with conjunctival MFH, local recurrence was documented in 3 and 2 of these patients underwent exenteration. Factors that correlate with metastasis and/or survival are depth, tumor size, and histological grade. In our case, a low metastatic potential may be expected considering the small size and superficial location of the conjunctival lesions. Among the 6 previously reported cases of conjunctival MFH, only 1 patient developed metastases, to the parotid gland and lungs.

Accepted for publication December 29, 1998.

We thank Marjolaine Gagnon, MD, FRCSC, for referring the patient and Nancy Perron, MD, FRCPC, for sending us part of the histopathologic material.

Reprints: Guy S. Allaire, MD, FRCPC, Department of Pathology, Centre Hospitalier de l'Université de Montréal (Campus Notre-Dame), 1560 Sherbrooke East, Montreal, Quebec, Canada, H2L 4M1.

REFERENCES