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Case report

Malignant sinonasal epithelioid schwannoma

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Abstract. Malignant schwannomas are rare neoplasms that are seldom found in the head and neck. Few cases have been reported involving paranasal sinuses and none of them was of the "epithelioid" type, In this report, an unusual case of epithelioid malignant schwannoma involving the maxillary sinus, nasal cavity and orbit is presented. The patient was a 27-year-old male with a history of headache, nasal obstruction and epistaxis. Histologically, the tumour had a biphasic pattern with spindle and epithelioid elements which led to a differential diagnosis with malignant melanoma. It had also to be distinguished from other neoplasms, such as squamous cell carcinoma and olfactory neuroblastoma because of it location. Immunohistochemical positivity for S–100 protein, glial fibrillary acidic protein and vimentin together with negativity for HMB–45 and cytokeratins, as well as mesaxon formation detected with electron microscopy were conclusive in the diagnosis. The patient was treated with surgical excision and radiotherapy but local recurrence and metastases occurred, and he died within 1 year after initial diagnosis.

Key words: Malignant epithelioid schwannoma – Nasal cavit – Paranasal sinuses

Introduction

Malignant schwannomas (MS) are unusual neoplasms in head and neck and even rarer involving paranasal sinuses and nasal cavity. To date relatively few cases have been reported in these locations and, to our knowledge, none of them has been of the "epithelioid" variant (Bailet et al. 1991; Goepfert et al. 1977; Millard and Busser 1952; Perzin et al. 1982; White 1971; Younis et al. 1991) (Table 1), which can cause differential diagnosis problems because of similarity with malignant melanomas and squamous cell carcinomas. We here report a case of epithelioid MS involving sinuses and nasal cavity.

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Table 1. Cases of malignant schwannoma involving the sinonasal region[a]

	Age	Sex	Location
Millard and Busser (1952)	42	F	Maxillary sinus
White (1971)	59	M	Nasal cavity
Goepfert et al. (1977)	21	F	Maxillary sinus
	16	M	Nasal cavity
Perzin et al. (1982)	?	F	Frontal sinus
	24	M	Maxillary sinus, orbit
	27	F	Maxillary sinus
Bailet et al. (1991)	63	M	Sinus (NOS)
	49	F	Nose (NOS)
	62	F	Sinus (NOS)
	77	F	Sinus (NOS)
	74	M	Sinus (NOS)
Younis et al. (1991)	63	F	Ethmoid & sphenoid sinuses

[a] All the cases correspond to conventional malignant schwannomas without mention of epithelioid component
NOS, Not otherwise specified

Case report

The patient was a 27-year-old male with a history of headache of 7 years duration. In the last 3 years he had progressive nasal obstruction and repeated epistaxis. The computed tomography-scan showed an infiltrative mass occupying the nasal cavity and ethmoid, also extending ipsilaterally to the maxillary and sphenoid sinuses and orbit (Fig.1). The exact site of origin from one of the two first locations was uncertain. Treatment was surgical excision and radiotherapy (65 Gy). The patient developed local recurrence and liver metastases 6 months after treatment. He died within the first year after initial diagnosis.

Histopathological findings. The specimen consisted of several irregular fragments of white-tan soft tissue excised from the nasal cavity, septum, ethmoid, maxillary sinus and rhinopharynx, some of them including bony tissue. It was routinely processed and stained with H & E and Wilders reticulin stain. Also, immunohistochemical staining with the avidin-biotin-peroxidase method was performed for cytokeratins, S–100, vimentin, glial fibrillary acidic protein (GFAP), neuron specific enolase (NSE), neurofilaments,

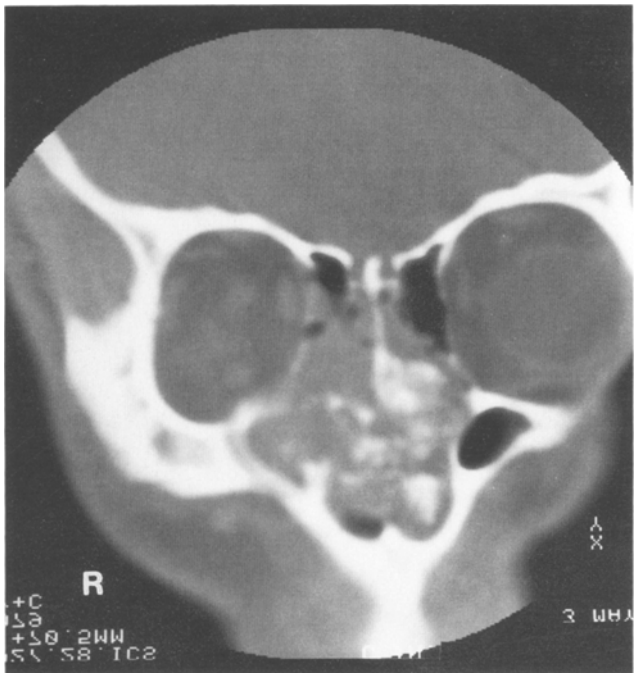

Fig. 1. CT-scan of the tumour involving the nasal cavity, and extending to ethmoid, maxilary sinus and right orbit

myoglobin, desmin (DAKO Calif., USA, 1/300, 1/500, 1/100, 1/300, 1/2000, 1/10, 1/2000, 1/100, respectively) and HMB–45 (NZM Diagnostic N.Y., USA, 1/4000).

Microscopically, the tumour elevated the overlying respiratory epithelium which in some places was ulcerated (Fig. 2a). The neoplasm had a biphasic pattern with bundles of fusiform elements which merged imperceptibly with cellular nests. The latter were compossed of elements with different degrees of elongation, ending in frankly polygonal cells with wide eosinophilic cytoplasm (Fig. 2b). Nuclei also ranged from elongated to round with clear nucleoplasm and one or two prominent eosinophilic nucleoli. Scattered bizarre nuclei with several nucleoli were also seen as well as clear nuclear inclusions. Mitoses were 3/10 hpf, some of them abnormal and in some areas they were grouped in a single hpf. (Fig. 3a). In other areas, nests were small with less than 10 cells and embedded in a highly vascular and hyaline stroma. Tumuor boundaries were usually ill-defined and focal bone invasion was evident.

Neoplastic cells showed diffuse positivity for S–100 protein (Fig. 3b) and vimentin, with stronger staining for both antibodies in the "epithelioid" areas. GFAP was also diffusely positive, although showing a rather weak reaction. Stronger expression of GFAP was seen in neoplastic cells with wide cytoplasm. The tumour was negative for HMB–45, cytokeratins and the rest of antibodies tested.

Electron microscopy. Ultrastructural examination of the neoplastic cells showed abundant production of extracellular basal lamina, which surrounded a complex system of cytoplasmic evaginations with schwannian features. Focally, the formation of clear-cut

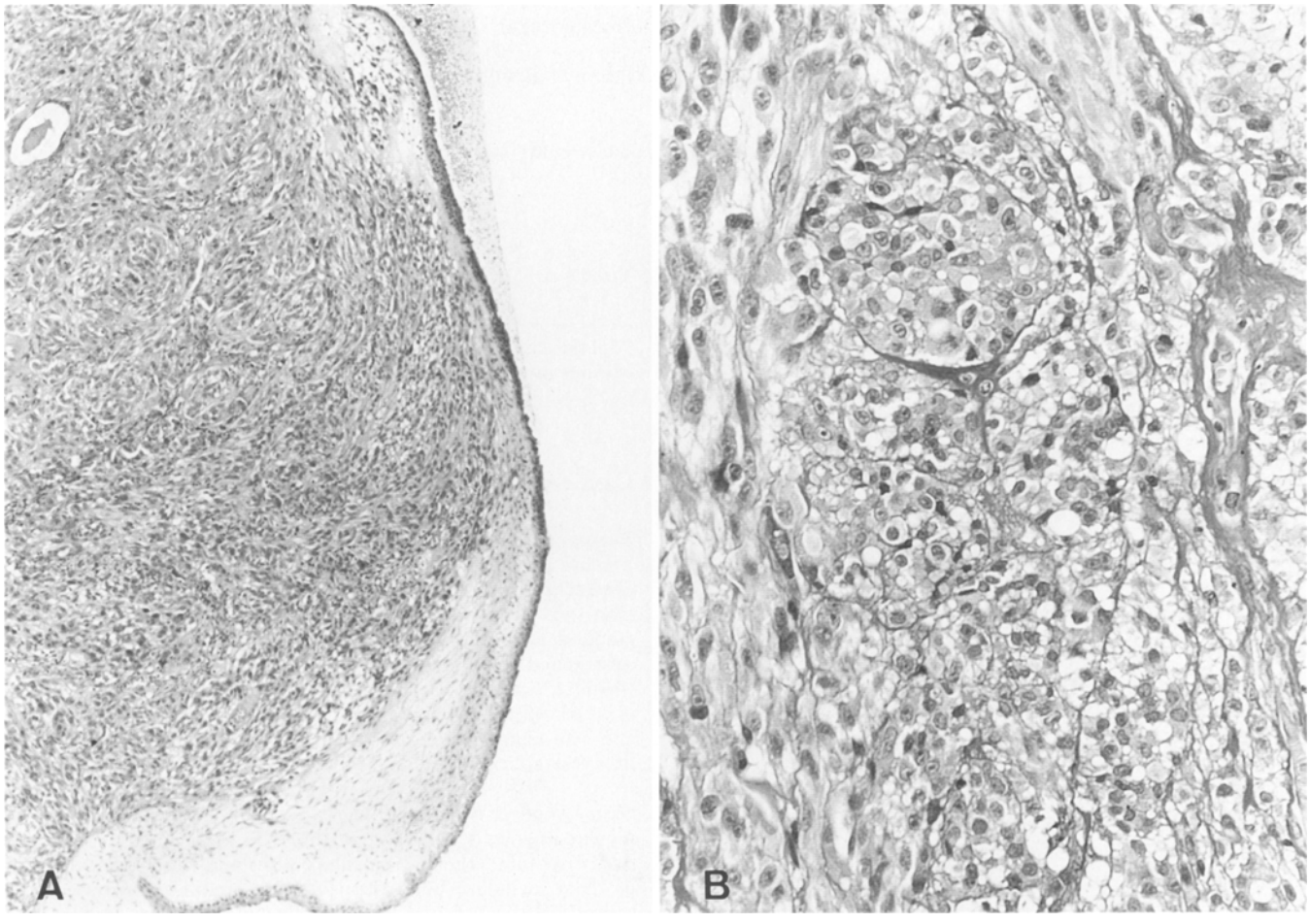

Fig. 2a. Low-power view of spindle-cell component of the tumour elevating the overlying normal sinusal mucosa. H & E × 10. **b** Biphasic component of tumour with predominance of epithelioid tumour nests merging with fusiform elements, seen only at the periphery. H & E × 100

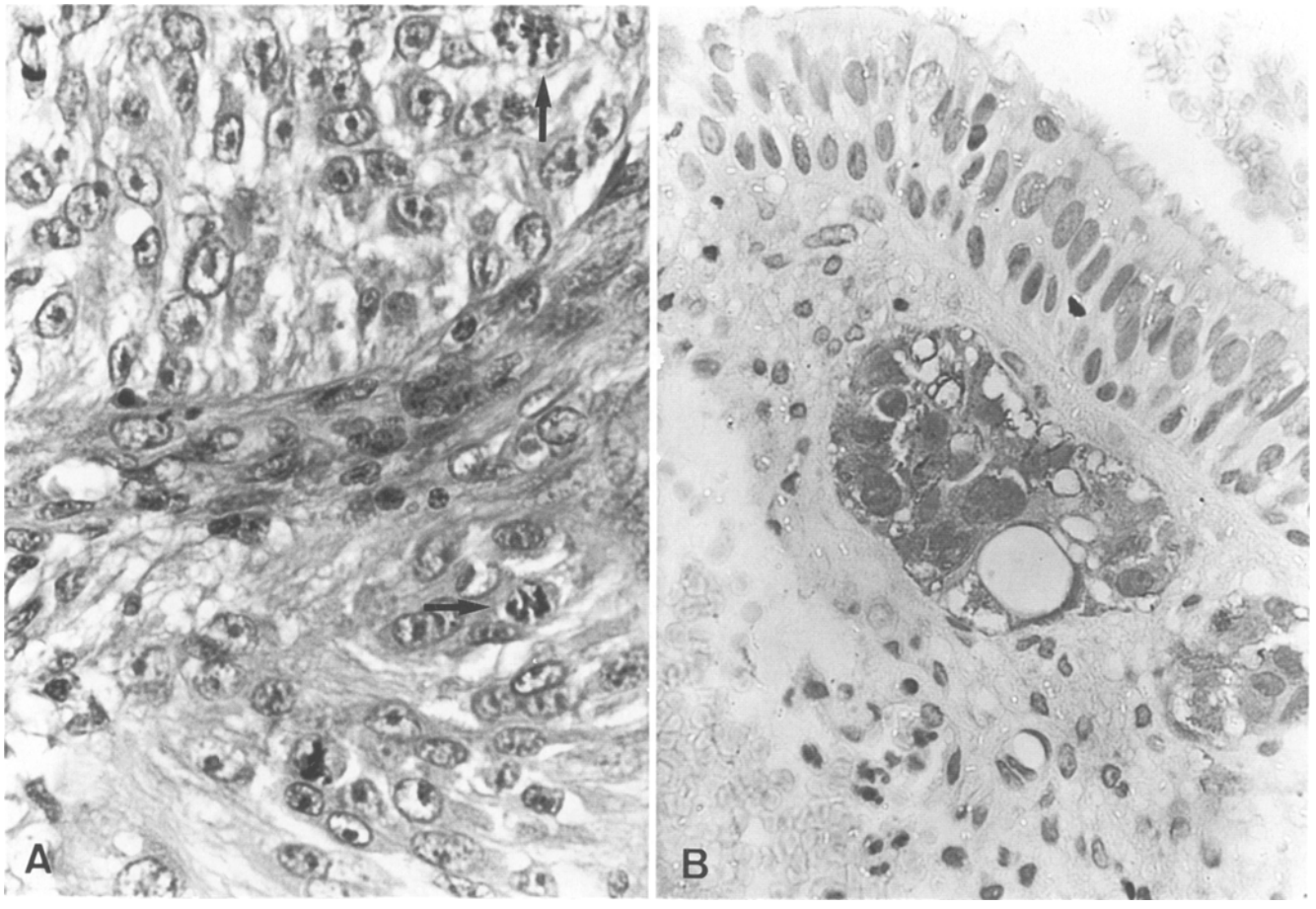

Fig. 3a. High-power of biphasic component showing similar nuclear features in both, with clear nucleoplasm, one or two prominent eosinophilic nucleoli, and several mitoses, some of them atypical *(arrows)*. H & E × 200. **b** Tumor cells underneath respiratory epithelium showing strong nuclear and cytoplasmic positivity for S–100 protein. Immunoperoxidase-haematoxylin × 200

mesaxons was evident (Fig. 4, *arrow*). No melanosomes nor premelanosomes were found. These findings were consistent with the diagnosis of MS.

Discussion

MS are uncommon tumours usually originating either from a pre-existing neurofibroma or from a peripheral nerve, most commonly in the extremities and in the context of a von Recklinhausen's disease (Abell et al. 1970; D'Agostino et al. 1963). Cases involving head and neck, although rare, have been reported previously (Conley and Janecka 1975; Grätz et al. 1991; Kragh et al. 1960; Perzin et al. 1982; Robitaille et al. 1975), but cases of the epithelioid variant are lacking. The term "epithelioid" is applied when areas resembling carcinoma or malignant melanoma are also found in a significant portion of the tumour, and they seem to count for about 5% of all MS (Alvira et al. 1976; Chu and Shmookler 1988; DiCarlo et al. 1986; Honma et al. 1989; Laskin et al. 1991; Lodding et al. 1986; Morgan and Gray 1985). This variety is less commonly associated with von Recklinghausen's disease than the usual type (DiCarlo et al. 1986; Laskin et al. 1991; Lodding et al. 1986). In the present case a dual component with areas of transition was evident. The epithelial areas showed a nesting pattern reminiscent of that of malignant melanoma. In cases reported in other locations, nodular arrangements like in our case, as well as rows or cords compossed of smaller cells were also found (DiCarlo et al. 1986; Laskin et al. 1991; Lodding et al. 1986). In other instances, this neoplasm can mimick malignant fibrous hystiocytoma, spindle-cell squamous carcinoma and signet-ring carcinoma. Also, it can have rhabdoid features or metaplastic bone (Laskin et al. 1991). In such cases, immunohistochemistry with positivity for S–100 protein and GFAP and electronmicroscopy are usually conclusive. In cases involving the nasal cavity, olfactory neuroblastoma must also be included in the differential diagnosis, but this lacks basal lamina and mesaxons, and usually contains abundant neurosecretory granules.

A demonstrable origin from a nerve or benign nerve sheath tumour or focus of conventional MS are often required for making a diagnosis of epithelioid malignant peripheral nerve-sheath tumour (Laskin et al. 1991). In our case, a pre-existing neurofibroma or nerve of origin could not be demonstrated and differential diagnosis with amelanotic malignant melanoma was first suggested. Nonetheless, the age of the patient (27 years) was

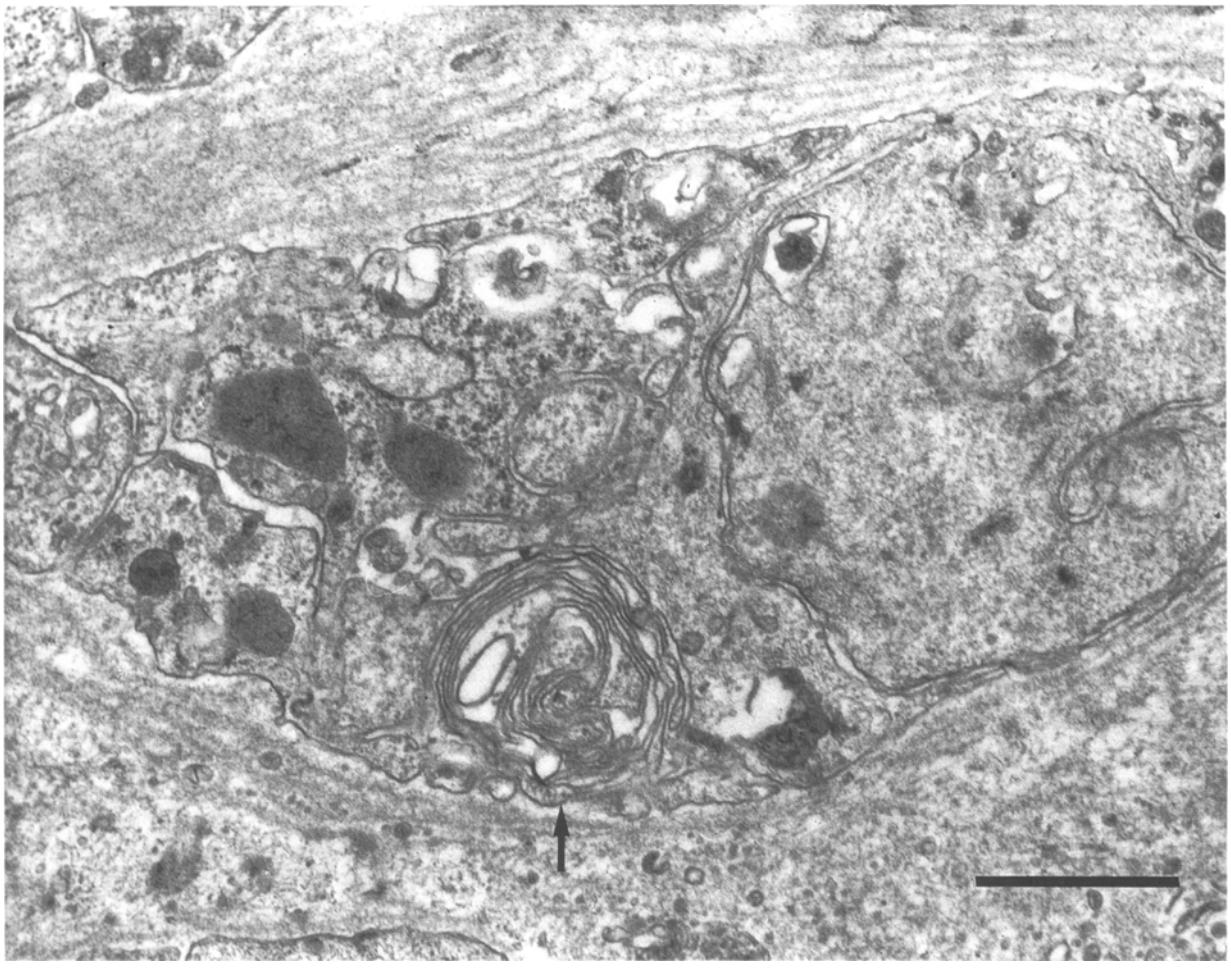

Fig. 4. Electron-microscopy demonstrated mesaxons formation *(arrow)* and basal lamina surrounding tumour cells. × 27000, Bar = 1 μm

unusual for this neoplasm, which in this location usually appears after 50 years of age (Cardesa et al. 1991). Negativity for HMB–45 and electron microscopy showing lack of melanosomes and premelanosomes, as well as the presence of mesoaxons and extracellular basal lamina confirmed the schwannian features of the neoplasm (DiCarlo et al. 1986; Erlandson and Woodruff 1982; Grätz et al. 1991; Honma et al. 1989; Laskin et al. 1991; Lodding et al. 1986). Also the spindle cell component was reminiscent of that of usual MS. The usual and spindle cell forms of squamous carcinoma can also cause differential diagnosis problems with epithelioid MS, but the complementary immunohistochemical and electron-microscopy studies will help.

These neoplasms usually follow a locally aggressive course, and are also capable of distant metastases, mainly through blood vessels with preference for lungs. They rarely involve lymph nodes (Greager et al. 1992; Lodding et al. 1986; Perzin et al. 1982), thus routine lymph node dissection is not recommended (Greager et al. 1992). In the present case the disease followed a similar progression with local recurrence and distant metastases 6 months after initial surgery. The extension of the surgical excision was conditioned in the present case by the unusual location. Treatment of choice for these rare neoplasms is usually wide excision when possible, since early recurrence after incomplete excision is the rule (Greager et al. 1992; Perzin et al. 1982). The usefullness of adjuvant chemotherapy is still debatable (Greager et al. 1992).

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