Case Report

Intranasal pericytic tumors (glomus tumor and sinonasal hemangiopericytoma-like tumor): Report of two cases with review of the literature

Xiao-Qiu Li,1,3* Masanori Hisaoka,1 Takashi Morio2 and Hiroshi Hashimoto1

Departments of 1Pathology and Oncology and 2Otorhinolaryngology, School of Medicine, University of Occupational and Environmental Health (UOEH), Kitakyushu, Japan and 3Department of Pathology, Cancer Hospital, Fudan University, Shanghai, People’s Republic of China

An intranasal glomus tumor and a sinonasal hemangiopericytoma-like tumor are reported. Both patients were elderly women suffering from nasal bleeding, and presented with a polypoid mass arising in the nasal septum. Microscopically, the glomus tumor displayed a proliferation of uniform rounded or cuboidal epithelioid cells arranged in sheets and interrupted by a rich vasculature with a characteristic configuration mimicking the normal glomus bodies, while the sinonasal hemangiopericytoma-like tumor featured a perivascular proliferation of spindle- to oval-shaped cells that were arranged in short fascicles. Both tumors shared immunohistochemical features supporting their myoid differentiation by the expression of vimentin, α-smooth muscle actin and muscle-specific actin, albeit with no immunoreaction to desmin. Both the intranasal glomus tumor and sinonasal hemangiopericytoma-like tumor are characterized by a perivascular growth pattern and myoid differentiation, having a close relation to the ‘perivascular myomas’, which was recently designated.

Key words: glomus tumor, nasal cavity, perivascular myomas, sinonasal hemangiopericytoma-like tumor

Glomus tumor, a distinctive neoplasm categorized in the group of perivascular tumors, typically occurs in the anatomic sites where normal glomus bodies are present (e.g. the subungual regions of fingers and the distal extremities including the wrist, palm and foot).1 Occasionally, it can also develop in some unusual locations where glomus bodies are normally sparse or absent, including the gastrointestinal and urogenital tracts, bone, nasal cavity and paranasal sinuses.2–20 Sinonasal glomus tumors are extremely rare. To the best of our knowledge, no more than 20 cases have previously been documented.6–20

The sinonasal hemangiopericytoma-like tumor is another mesenchymal tumor in the sinonasal region also characterized by a prominent perivascular growth pattern.21–30 Although it might have been termed as ‘sinonasal hemangiopericytoma’, this kind of tumor is believed to be an entity clinicopathologically distinct from the conventional hemangiopericytoma that arises in the soft parts.21,22,24,29 The exact nature of sinonasal hemangiopericytoma remains unclear, although some authors have suggested its close relation to glomus tumor.29,30

We report one case each of intranasal glomus tumor and sinonasal hemangiopericytoma-like tumor with a review of the literature in order to emphasize their close clinicopathological relationship.

CLINICAL SUMMARY

Case 1

A 69-year-old woman had repeated rhinorrhagia from the left nasal cavity. Physical and radiological examinations revealed a mass measuring about 1 cm in diameter located in the left side of the nasal septum (Fig. 1). After a biopsy, the lesion was diagnosed as intranasal glomus tumor and surgically removed. The patient was well without evidence of recurrence 7 months after surgery.
Case 2

A Japanese woman complained of right nasal bleeding at the age of 81 years. Otolaryngological examination showed a hemorrhagic polypoid mass measuring 1.5 cm at the greatest diameter in the right nasal cavity. The lesion arose from the septum at the level of the middle turbinate and extended to the lower part of the common nasal passage (Fig. 2). The pathological diagnosis of sinonasal hemangiopericytoma-like tumor was made after a biopsy of the mass, and a marginal excision was then performed. The patient died of unrelated disease 5 years later without recurrence of the tumor.

**PATHOLOGICAL FINDINGS**

Tumor tissues were routinely fixed in 10% formaldehyde and paraffin embedded. Sections (4 μm thick) were stained with hematoxylin and eosin (HE). Immunohistochemical staining was performed on paraffin sections using the EnVision detection system (DAKO Japan, Kyoto, Japan). The primary antibodies raised against cytokeratin (AE1/AE3; DAKO Corp., Carpinteria, CA, USA, dilution: ×200), epithelial membrane antigen (EMA) (E29; DAKO A/S, Glostrup, Denmark, dilution: ×100), vimentin (V9; DAKO A/S, dilution: ×30), α-smooth muscle actin (1A4; DAKO A/S, dilution: ×150), muscle-specific actin (HHF35; Enzo Diagnostics Inc, Farmingdale, NY, USA, dilution: ×50), desmin (D33; DAKO A/S, dilution: ×50), CD34 (QBEnd-10; Immunotech, Marseilles, France, dilution: ×100), factor XIIIa (polyclonal; Calbiochem, San Diego, CA, USA, dilution: ×500) and type IV collagen (F59; Fuji, Toyama, Japan, ×100) were used in the current study. A pretreatment of tissue sections with protease in a water bath (37°C, 20 min) was adopted before the staining of cytokeratin, factor XIIIa and type IV collagen.

Case 1

On histological examination, the submucosal well-demarcated tumor was composed of solid sheets or packets of polygonal or round-shaped epithelioid cells interrupted by blood vessels of varying size (Fig. 3a). At the periphery of the lesion, clusters of tumor cells were arranged around separate vessels in a myxoid stroma (Fig. 3b). The tumor cells were characterized by uniform round nuclei, sparse chromatin, inconspicuous nucleoli, and well-defined, pale eosinophilic cytoplasm. In addition to the monotonous appearance of these epithelioid cells, short spindle-shaped cells with elongated nuclei were identified in some perivascular areas (Fig. 3c). Mitotic figures were absent.

Immunohistochemically, the tumor cells were diffusely positive for vimentin, α-smooth muscle actin and muscle-specific actin (Fig. 3d), and focally reactive to CD34, but were negative for cytokeratin, EMA, desmin, and factor XIIIa. A positive staining for type IV collagen highlighted the network of the intercellular matrix.

Case 2

Microscopically, the well-defined tumor featured a cellular proliferation of spindle cells interspersed by a rich vascular structure (Fig. 4a). The vascular structures ranged from ectatic thin-walled vessels varying in shape and size to capillary-like small vessels. The spindle- to oval-shaped tumor cells were characterized by elongated or plump nuclei, eosinophilic fibrillar cytoplasm and indistinct cell borders, somewhat reminiscent of smooth muscle cells, and were arranged predominantly in a short fascicular (Fig. 4b) or storiform pattern. No mitotic figures were identified. Inflammatory infiltrates includ-
Figure 3  Histological features of the glomus tumor. (a) The tumor is composed of solid sheets of polygonal or round-shaped cells interrupted by blood vessels of variable size (HE, ×100). (b) Clusters of tumor cells surrounding the separate vessels as well as the myxoid stroma at the periphery of the lesion (HE, ×100). (c) A transition between epithelioid cuboidal tumor cells and spindle-shaped cells with elongated nuclei seen in some perivascular areas (HE, ×200). (d) Tumor cells positive for muscle-specific actin (immunohistochemical stain, ×200).

Figure 4  Histological features of the sinonasal hemangiopericytoma-like tumor. (a) The well-defined tumor consists of a cellular proliferation of spindle- to oval-shaped cells interspersed by a rich vasculature. (HE, ×50). (b) Tumor cells characterized by their elongated or plump nuclei and indistinct eosinophilic cytoplasm are arranged in a fascicular pattern (HE, ×200). (c) Cytoplasmic staining for α-smooth muscle actin in many tumor cells (immunohistochemical stain, ×200).
tumors arising from the sinonasal region differ little from reported.

Cytokeratin, IV collagen, but negative for desmin, CD34, EMA and cytokeratin.

Perivascular tumors are generally considered to be neoplasms derived from, or differentiating to, perivascular cellular components, among which glomus tumor is one example. Glomus tumor is a neoplastic proliferation of perivascular cells recapitulating the appearance of normal glomus body structures, and commonly develops in glomus body-rich anatomic sites. One of the most characteristic presentations in patients with a glomus tumor is a painful subungual nodule of the finger tip. Nevertheless, this kind of tumor can also occasionally occur in some other locations including the nasal cavity and paranasal sinuses. Sino-nasal glomus tumor is rare, and only limited cases have been documented in world literature. Elderly patients predomi-nate in most series (age ranges from 24 to 89 years, with an average of 55 years), and a female predilection has been reported.

The tumors usually present as polypoid masses located in the nasal cavity or paranasal sinuses. The most common site is the nasal septum. Less frequently, a tumor can develop in the ethmoidal sinus and secondarily involve the nasal cavity. Clinical symptoms include nasal obstruction, epistaxis, pain and rhinorrea. Pathological features of glomus tumors arising from the sinonasal region differ little from those in other sites. Most are a common form of glomus tumor with typical histological features, as seen in the present case. Two variants of glomus tumor; glomangioma and glomangiomyoma, which were sporadically reported, are characterized by a prominent angiomatus pattern and a vasculomuscular component, respectively.

Ultrastructurally and immunohistochemically, the tumor cells show marked myoid differentiation characterized by abundant cytoplasmic bundles of actin-like filaments and immunoreactivity to myogenetic markers, including muscle-specific actin, smooth muscle actin and, rarely, desmin. The common form of nasal glomus tumors is only rarely confused with other lesions because of the characteristic microscopic features. Nevertheless, a cellular glomus tumor occasionally needs to be distinguished from malignant melanoma, olfactory neuroblastoma and rhabdomyosarcoma arising in the sinonasal region. These lesions may resemble glomus tumor by a proliferation of small to medium-sized, rounded or epithelioid cells. However, melanoma cells express S-100 instead of actin. Olfactory neuroblastomas are negative for myogenic markers, but positive for neuron-specific enolase, synaptophysin and neurofilament protein. Rhabdomyosarcomas are also immunophenotypically distin-guished from glomus tumors in their constant expression of desmin. Due to a prominent vascular component, it is not unusual that a glomangioma or glomangiomyoma might be mistaken for a cavernous hemangioma, especially when the dilated gaping veins predominate and small clusters of glo-mus cells are unfortunately overlooked. In such instance, careful microscopic examination is necessary to establish the correct diagnosis. Most sinonasal glomus tumors are benign and simple excision is usually curative although a local recurrence, probably due to the incomplete resection, has been reported. Agressive behavior of a histologically benign nasal glomus tumor has been described by Hayes et al. This tumor repeatedly recurred but did not metastasi-size. There have been no reports of morphogically atypical or malignant sinonasal glomus tumors.

Another distinctive sinonasal neoplasm featured by a perivascular growth pattern is the sinonasal hemangiopericytoma-like tumor. This type of tumor predominantly affects adults in the sixth and seventh decade of life (mean age: 58 years), and no sex predilection has been observed. Lesions usually originate in a paranasal sinus and extend, second, into the nasal cavity. Patients most commonly have symptoms of nasal obstruction and epistaxis. Morphologically, the sinonasal hemangiopericytoma-like tumor consistently displays a myoid appearance without cellular pleomorphism. In contrast to a haphazard distribution of tumor cells in ordinary hemangiopericytoma, tumor cells in a sinonasal hemangiopericytoma-like tumor are usually arranged in certain patterns such as sheets, short fascicles and long rows.

Immunohistochemically, most of the previously reported cases of sinonasal hemangiopericytoma-like tumors showed a phenotype distinct from conventional hemangiopericyto-mas due to their myoid differentiation and absence of CD34 expression. Electron microscopic findings have also suggested overlapping myoid and pericytic features (e.g. complete or incomplete basal lamina, cytoplasmic myofilaments with or without dense bodies, pinocytosis and multiple cytoplasmic processes) of tumor cells in sinonasal hemangiopericytoma-like tumors. Regarding biological behav-iour, sinonasal hemangiopericytoma-like tumors generally demonstrate a much lower malignant potential than conven-tional soft tissue hemangiopericytomas. Most cases can be cured by adequate surgical resection. The tumor may recur locally, especially when it has not been completely removed. However, no metastases or aggressive recurrences have been reported.

Because of their distinct features aforementioned, sinonasal hemangiopericytoma-like tumor should not be confused
with conventional soft tissue hemangiopericytoma. Other candidates for the differential diagnosis of sinonasal hemangiopericytoma-like tumor may include solitary fibrous tumor. Solitary fibrous tumor is mainly composed of spindle cells, and frequently demonstrates a striking pericytic vascular pattern, mimicking sinonasal hemangiopericytoma-like tumor. However, the histological hallmark of intercellular collagen and the immunoreactivity to CD34 distinguish this type of tumor from sinonasal hemangiopericytoma-like tumor.

Some authors have speculated a possible relationship between the sinonasal hemangiopericytoma-like tumor and glomus tumor. Rosai has a view that the sinonasal hemangiopericytoma-like tumor may represent a hybrid between hemangiopericytoma and glomus tumor. More recently, Tse and Chan stated that the sinonasal hemangiopericytoma-like tumor is biologically a variant of the glomus tumor, based on the striking similarities between both tumor types concerning biological behavior, cytological profiles and immunophenotypes. Granter et al. and Kutzner proposed the concept of ‘perivascular myomas’ These lesions seem to comprise a histological continuum which can be divided into at least three categories: myofibromatosis, glomangiopericytoma and myopericytoma. Common clinicopathological features among the three types of tumor include the superficial locations in the distal extremities, a potential to recur, epithelioid to spindle-shaped tumor cells oriented around vessels frequently with a hemangiopericytomatous pattern and myoid differentiation of the tumor cells. It has also been presumed that these tumors may originate from pluripotent periendothelial cells capable of differentiating along smooth muscle, pericytic and glomus cell lines. Both the sinonasal hemangiopericytoma-like tumor and intranasal glomus tumor also seem to be closely related to ‘perivascular myoma’.

REFERENCES


