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Temporal Bone Histopathology Case of the Month GLOMUS TUMORS

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Glomus tumors arise from the paragangliar system of the temporal bone. They are generally found in the dome of the jugular bulb, but also may be seen in the tympanic plexus on the promontory in the middle ear. These neoplasms are highly vascularized and histologically benign in most cases. They typically grow very slowly, infiltrating and invading adjacent structures, including the bone of the jugular fossa, the mastoid process, the facial nerve, lower cranial nerves, the labyrinth, and in some cases, the petrous apex and cranial cavity (1). Patients with glomus tumors usually present with conductive hearing loss and pulsatile tinnitus (2). Growth of the tumor can cause facial nerve paralysis, vertigo, hoarseness, and paralysis of the lower cranial nerves. The ideal treatment for glomus tumors is complete surgical excision with preservation of neurovascular structures (3). However, some authors have recommended radiation therapy for these tumors because it is associated with less morbidity of the lower cranial nerves (2). The effects of irradiation seem to be on the blood vessels and fibrous elements of the lesion. Radiotherapists have reported control of glomus tumors ranging from 84% to 98% (2,4). Neuroepithelial elements are relatively radioresistant, but the vascular elements, which actually constitute the bulk of the tumor, gradually shrink and fibrose after radiotherapy (4). The fibrosis is apparently the basis for long-term control. However, there are limited postmortem histopathologic studies related to the evaluation of the radiotherapeutic effects on glomus tumors.

CASE REPORT

A 68-year-old woman presented with pulsatile tinnitus and hearing loss in the left ear and numbness of the left side of the face. On otoscopic examination, the left eardrum had a dull and somewhat reddish appearance with 2 mammary-like protrusions in the posterior quadrant. She also had a decreased area of sensation in the soft palate; the uvula deviated to the right side. The patient had some hypalgesia on her left face and right body. An audiogram showed total sensorineural hearing loss in the left ear. She was diagnosed with a glomus tumor based on radiologic findings and clinical manifestations. The patient was treated with cobalt irradiation therapy (4,000 rad). At a 6-month follow-up examination, the tumor showed no evidence of growth.

HISTOPATHOLOGY

Glomus tissue fills the middle ear, surrounds the ossicular chain, and extends into the eustachian tube and the attic, but not into the mastoid (Figs. 1 and 2). The mastoid is filled with a serous exudate containing some polycells and a few cholesterol crystals. The glomus has broken through the eardrum into the posterior superior quadrant. It has also ruptured the eardrum anterior to the malleus. There is a large tympanosclerotic hyalinized plaque anterior

to the menubrium. Just below the level of the round window, Jacobson's nerve and the arteries accompanying it, branch off from their respective roots and project posteriorly and laterally into the tumor mass. Below this point, the artery is much larger than normal and larger than that of the above branch. It is interesting that the nerve also bifurcated in this area to follow this artery. The tumor in the external auditory canal is covered by squamous epithelium. The tumor seemed to be arising from the area of Jacobson's nerve because no direct relationship to the jugular bulb could be identified. The tumor extended into the epitympanum and did not invade or destroy the tegmen.

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Fig. 1. Large glomus tumor filling the middle ear. Cochlea ©, carotid artery (ca), facial nerve (f), glomus tympanicum (GT), incus (i), internal auditory canal (iac), malleus (m), and vestibule (v) (hematoxylin and eosin; original magnification, $\times 10$).

Fig. 2.

Higher power image of glomus tympanicum tumor. Nests of epithelioid cells are separated by reticulin fibers of the subendothelial layers of the vascular spaces. The epithelioid cells are polyhedral or ovoid shape. The cytoplasm is occasionally more dense and eosinophilic. The nuclei of epithelioid cells are round or ovoid shape. The cytoplasm is occasionally more dense and eosinophilic. The nuclei of epithelioid cells are round or ovoid shape, vesicular, and often hyperchromatic. Occasionally, the cells include 2 or more nuclei (hematoxylin and eosin; original magnification, $\times 20$).