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Angiofibroma Confined to the Pterygoid Muscle Region: CT and MR Demonstration

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Summary: We report a case of angiofibroma confined to the pterygoid muscle plane without involvement of the sphenopalatine foramen or nasopharynx. The lesion was demonstrated on CT, MR, and angiography with typical findings of a hypervascular mass and was surgically resected after embolization.

Index terms: Angiofibroma; Pterygopalatine fossa

Juvenile angiofibromas are uncommon tumors that usually occur in adolescent boys and account for approximately 0.5% of all neoplasms of the head and neck (1). These tumors virtually always arise from the nasopharynx in the region of the sphenopalatine foramen and pterygopalatine fossa (1–4). This report presents an angiofibroma that was confined to the pterygoid muscle region, without involvement of the sphenopalatine foramen or nasopharynx.

Case Report

An 18-year-old man presented with left submandibular discomfort of 2 months' duration. He denied hemorrhage or respiratory difficulty. Physical examination revealed a submucosal mass protruding into the left side of the oropharynx with displacement of the left tonsil.

Computed tomography (CT) showed an intensely enhancing mass that was well defined in the pterygoid muscle region. The left pterygoid plate was displaced anteriorly without erosion. Displacement of adjacent tissue planes without invasion was shown with normal pterygopalatine fossa (Fig 1A).

Magnetic resonance (MR) showed a mass with intermediate signal intensity. Internal fine stippled signal voids representing tumor vascularity were demonstrated on T1-weighted images. The mass was surrounded by a thin layer of muscle intensity. On enhanced T1-weighted imaging the mass was well enhanced with internal signal voids of salt-and-pepper appearance. On T2-weighted imaging, the mass had intermediate signal intensity higher than that of normal muscles and lower than that of the nasal mucosa (Fig 1B–D). A coronal scan showed displacement and thinning of the pterygoid muscle. Again the mass had internal signal voids (Fig 1E). External carotid arteriography showed marked hypervascularity of the mass with the blood supply from the sphenopalatine, ascending palatine, and accessory meningeal arteries (Fig 1F). Preoperative differential diagnosis was intramuscular hemangioma or unusually located paraganglioma, considering hypervascularity of the mass.

The mass was surgically excised after embolization of the feeding arteries with polyvinyl alcohol particles. At surgery, the mass was covered by a thin muscle tissue, presumably the compressed medial pterygoid muscle. The mass extended from the styloid process to the pterygoid plates and almost to the skull base superiorly. There were numerous friable new vessels surrounding the mass. The specimen was oval, soft, and $5.5 \times 4 \times 3$ cm (Fig 1G). Histologic examination revealed cells with round, ovoid, or short spindle nuclei with scattered stromal cells containing stellate nuclei, typical of an angiofibroma (Fig 1H and I). A prominent vascular component consisting of small compressed and some larger gaping vessels was apparent. The vessels were devoid of a smooth muscle component.

Discussion

Juvenile angiofibroma is a benign nonencapsulated fibrovascular tumor that usually originates from the superolateral aspect of the choana, but may also arise more medially, near the vomer, from the pharyngeal roof or adjacent pterygoid plates. It extends submucosally into the adjacent open spaces and passages (1–10). The sphenopalatine foramen and pterygopalatine fossa are almost always involved.

Bryan et al (2) have divided nasopharyngeal angiofibromas into three types according to which anatomic compartment the tumor occupies. Type 1 lesions extend medially from the sphenopalatine foramen and pterygopalatine fossa to lie within the nasal cavity. Type 2 le-

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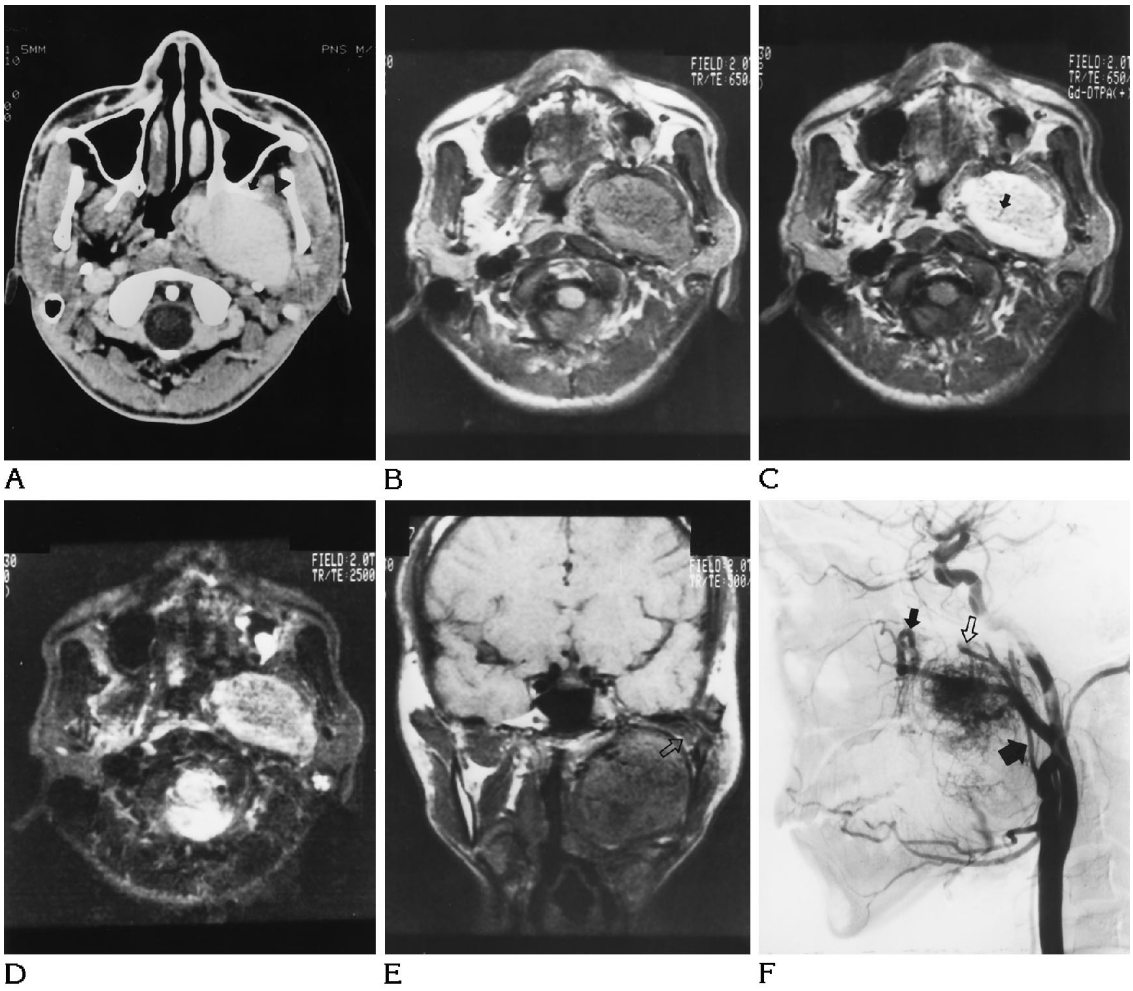


Fig 1. CT, MR, and angiography of an 18-year-old man with angiofibroma confined to the pterygoid muscle plane.

A, Postcontrast CT shows an intensely enhancing mass in the pterygoid muscle region (*arrowhead*) with anterior displacement of the pterygoid plate (*arrow*) and pterygopalatine fossa without invasion.

B, On axial T1-weighted MR imaging, the mass has intermediate signal intensity with internal fine stippled signal voids.

C, On enhanced axial T1-weighted imaging, the mass is well enhanced and contains signal voids of salt-and-pepper appearance (*arrow*).

D, On axial T2-weighted imaging, the mass shows intermediate signal intensity.

E, Coronal T1-weighted imaging shows displacement and thinning of the pterygoid muscle (*open arrow*) draping the mass.

F, External carotid angiography shows hypervascularity of the mass with arterial supply from the sphenopalatine (*small solid arrow*), ascending palatine (*large solid arrow*), and mainly accessory meningeal arteries (*open arrow*). *Figure continues.*

sions have extension laterally into the infratemporal fossa, and type 3 tumors extend intracranially.

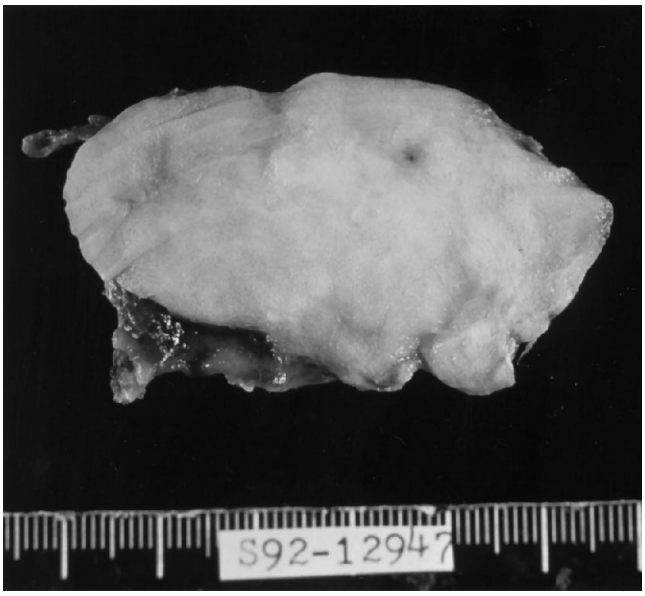
Johnson (8) has reported a CT finding in a case of angiofibroma in the parapharyngeal space. In our case, CT, angiography, and MR show a very unusually located angiofibroma, confined to the pterygoid muscle region, without involvement of the pterygopalatine fossa. The pterygoid plates were displaced anteriorly, unlike usual posterior bowing seen with typical nasopharyngeal angiofibroma, which expands the pterygopalatine fossa.

Although atypical in location, our case showed typical radiologic finding of angiofibromas on CT and angiography and also characteristic features of angiofibroma on MR.

The masses that can involve the pterygoid muscle region include parotid tumor, intramuscular hemangioma, unusually located paraganglioma, lymph nodes, and metastasis (1, 10). Our report adds another lesion to the differential diagnosis of masses confined to the pterygoid muscle region.

The appearance of an angiofibroma would be difficult to distinguish from a paraganglioma or

Fig 1, *continued*. *G*, The specimen is a pinkish-white firm mass measuring 5.5 × 4 × 3 cm. The cut surface of the mass is yellowish-white and homogeneous, with focal white trabeculation. Histologic examination with hematoxylin-eosin stain (*H*) and high magnification (*I*) show cells with round, ovoid, or short spindle nuclei with scattered stromal cells containing stellate nuclei, typical of an angiofibroma. Note the prominent vascular and cellular fibrous tissue components.



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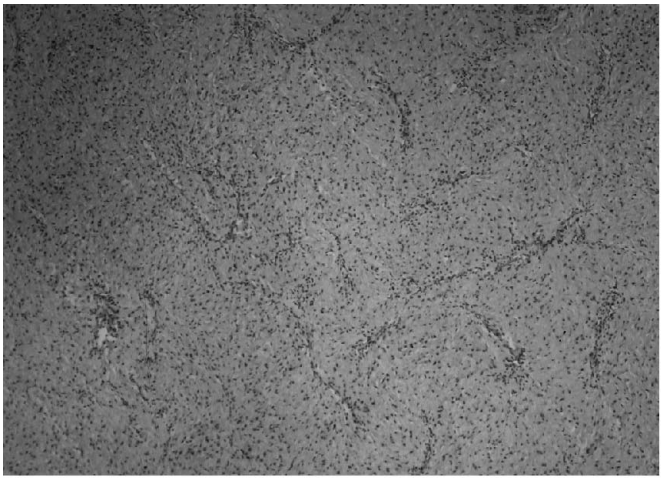

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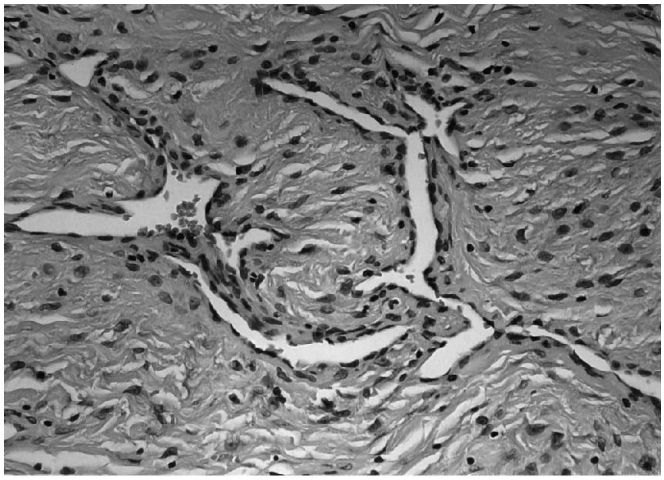

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hypervascular metastasis. However, the occurrence of a radiographically similar lesion in an adolescent boy should raise the possibility of an angiofibroma.

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