Juvenile Angiofibroma

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Case History: A 16-year-old boy presents with right-sided nasal obstruction and intermittent, spontaneous epistaxis. There were no otologic complaints. On examination, he had a large fleshy mass completely filling the nasopharynx. Other physical examination and laboratory investigations were normal. CECT was done.
Homogenously enhancing mass lesion centered at sphenopalatine foramen (widened by the mass, shown by black arrows), extending into nasopharynx (yellow arrow) and pterygopalatine fossa (red arrow). The mass also fills ipsilateral nasal cavity, pushing the septum to left.
Coronal bone CT revealing the widened right sphenopalatine foramen (arrows) due to the juvenile angiofibroma.
Coronal CT image showing superior extension into right sphenoid sinus through erosion of its floor and extension into infratemporal fossa (infrazygomatic masticator space)
Axial CECT image showing extension of the lesion into right buccal space (obliterating the retromaxillary fat pad which is normally present- denoted by asterisk on left side) and into right masticator space (infratemporal fossa, M- Masseter muscle) through pterygomaxillary fissure. The arrow indicates the characteristic anterior bowing of the posterior wall of maxillary sinus due to juvenile angiofibroma.
Arrow indicates the anterior displacement of the posterior wall of the right maxillary sinus by the mass lesion (bow sign), in a sagittal reconstruction image. This is also known as the Holman - Miller sign, which was initially described on plain X-ray films. The contralateral normal posterior wall is shown for comparison.
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Published on Diagnostic Imaging (http://www.diagnosticimaging.com)

Coronal bone CT showing the widening of gap between ramus of mandible and maxillary body on the right side compared to left, suggestive of infratemporal fossa involvement by juvenile angiofibroma. This is the Hondousa sign initially described on X-ray.

CT scan shows a large, lobular, well-circumscribed soft tissue mass lesion centered in the posterior part of nasal cavity at the margin of sphenopalatine foramen on right side with multiple surrounding extensions. The mass lesion shows diffuse avid enhancement on administering contrast, findings consistent with juvenile angiofibroma. The lesion widens the sphenopalatine foramen and extends into the pterygopalatine fossa and also extends into nasal cavity anteriorly. The lesion further extends into buccal space and masticator space (infratemporal fossa). Superiorly, it extends into the right sphenoid sinus through roof of nasopharynx. However, there is no extension into the orbit or middle cranial fossa.

**Diagnosis:** The patient underwent surgical resection of the lesion and histopathology confirmed juvenile angiofibroma.

**Discussion:** Juvenile angiofibroma (JAF) is a benign, vascular, non-encapsulated locally invasive nasal cavity mass found exclusively in adolescent males. It extends from posterior nasal cavity into nasal cavity, nasopharynx and pterygopalatine fossa.

On NCCT, it is seen as a soft tissue mass originating at the sphenopalatine foramen margin with multiple surrounding extensions and shows intense enhancement on CECT. On MR, it displays intermediate signal on T1W and bright signal intensities on T2W images with avid enhancement on post-gadolinium images. Punctuate and serpentine flow voids may be seen within the tumor. Internal maxillary and ascending pharyngeal arteries from the ECA are the most common feeding vessels.

Different staging systems have been in use, most commonly those of Chandler, Sessions and Fisch. The radiologist should look for the extensions into surrounding structures, particularly orbit via
inferior orbital fissure and cranial cavity through foramen rotundum/ vidian canal. Failure to identify them may result in incomplete surgical resection. Differential diagnoses include encephalocele, antrochoanal polyp, hemangioma and rhabdomyosarcoma.

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References: