Hairy Polyp of the Nasopharynx Arising from the Eustachian Tube

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Abstract Hairy polyps of the nasopharynx display characteristic radiological imaging findings, including the presence of fat in the polypoid mass. Furthermore, diagnostic imaging is useful for delineating the site of origin of these lesions, which can facilitate surgical planning. For instance hairy polyps that arise from the right Eustachian tube can be amputated via a trans-nasal approach with endoscopy, but may necessitate a two stage approach in order to avoid injury to critical structures, such as the internal carotid artery. On histology, hairy polyps comprise an outer keratinizing squamous epithelium with adnexal tissue, including hair follicles, and central fibroadipose and cartilaginous tissue. These features are exemplified in this sine qua non radiology-pathology correlation article.

Keywords Hairy polyp · Nasopharynx · Eustachian tube · MRI · Pathology

History

The patient is a newborn male delivered at 40w0d gestational age with Apgar scores of seven and nine. Shortly after delivery, the patient was in respiratory distress that

required intubation. Flexible laryngoscopy was performed after extubation, which demonstrated a white tubular mass within the nasopharynx that emerged from the right Eustachian tube orifice.

Radiographic Features

The diagnosis of hairy polyp was suggested based on the diagnostic imaging findings.

CT (Fig. 1) showed a fat attenuation mass surrounding a central core of linear soft tissue corresponding to a fibrovascular stalk and arising from the right Eustachian tube orifice. The lesion protruded slightly into the otherwise clear middle ear cavity, adjacent to the carotid canal with a thinned wall. The CT was useful for preoperative delineation of the surrounding bony structures, including the carotid canal, middle ear cavity, and ossicles. The MRI (Fig. 2) demonstrated a T1 hyperintense polypoid nasopharyngeal mass with loss of signal using fat suppression and a thin linear intermediate signal structure corresponding to a fibrovascular stalk that extended from the right Eustachian tube. The MRI was useful for excluding an intracranial component.

Diagnosis

The resected specimen comprised a smooth white tubular mass covered by skin (Fig. 3). Histology demonstrated adnexal structures in the skin overlying mesenchymal tissue comprised mostly of fat and cartilaginous nodules, as well as a central fibrovascular stalk (Fig. 4), compatible with a hairy polyp.

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Treatment

Transnasal endoscopic excision of nasopharyngeal mass was performed. In particular, the mass was amputated at the Eustachian tube orifice. The patient was extubated on postoperative day 1 and was able to breathe normally. A second stage procedure to remove the rest of the lesion from the Eustachian tube and middle ear has been planned for when the child is older.

Fig. 1 Axial CT image shows smooth widening of the right Eustachian tube by the mass (*arrow*), which protrudes slightly into the middle ear cavity, adjacent to the carotid canal (*arrowhead*), which has a very thin wall

Fig. 2 Axial T1 (**a**) and fat-suppressed T2 (**b**) MR images show a polypoid mass containing fat within the nasopharynx that extends from the right Eustachian tube (*arrow*)

Discussion

Hairy polyps are benign congenital malformations that typically present at birth with respiratory distress, shortness of breath, cyanosis, and difficulties with oral intake [1, 2]. Hairy polyps of the nasopharynx most commonly arise from the lateral wall or superior aspect of the pharynx, but can also arise from the hard and soft palates, tonsils, tongue, Eustachian tube, and middle ear [1–4]. Hearing loss, otorrhea and otitis media can occur if the lesion arises from

Fig. 3 Gross specimen photograph shows a smooth white polypoid mass

Fig. 4 Hematoxylin and eosin stained cross sectional photomicrographs of the hairy polyp obtained at 1.25X (a) and 3X (b) original magnification show skin containing multiple pilosebaceous units overlying a mesenchymal core predominantly comprised of fat and a fibrovascular stalk (arrow)

the external auditory canal and middle ear. In the literature, terms such as dermoid, hamartoma, teratoma, and choristoma have been used interchangeably to describe hairy polyps. However, histopathologically, hairy polyps are comprised of mesodermal and ectodermal derivatives and are perhaps most appropriately characterized as dermoids [4]. The mesenchymal components often include fat and cartilage, while the outer ectodermal layer is comprised of a keratinizing squamous epithelial layer with adnexal structures, such as hair follicles, hence the term hairy polyp.

Radiological imaging is useful for surgical planning, particularly in cases that are otherwise obscured by the presence of an endotracheal tube, and for evaluating associated otolaryngological complications [1]. Characteristic imaging features on CT include a smooth polypoid mass, containing fat attenuation with linear soft tissue attenuation centrally that corresponds to the fibrovascular stalk [3]. CT is useful for delineating the relationship of the mass to the carotid canal, which may be thinned and remodeled by the adjacent mass-effect from the tumor in the Eustachian tube. On MRI, hairy polyp demonstrate predominantly hyperintense signal on T1- and T2-weighted sequences, with loss of signal fat suppression techniques [3], while the fibrovascular stalk appears as a linear intermediate signal structure that can enhance.

Although the differential diagnosis for pediatric nasopharyngeal masses is broad and includes meningoencephaloceles, teratomas, hamartomas, nasal glial heterotopia, congenital salivary gland anlage tumors, hemangiomas, vascular malformations, neurenteric cysts, and craniopharyngioma, in addition to hairy polyps, the CT and MRI findings of hairy polyps are rather characteristic. Indeed, the differential diagnosis for fat-containing masses in the nasopharynx in general is limited to teratomas and hamartomas, which tend to be more heterogeneous [5], and lipomas and their variants, such as chondrolipomas or fibrolipomas, which very infrequently arise from the nasopharynx and Eustachian tube, and tend to occur in adults rather than in neonates [6].

The treatment of choice is surgical excision of the hairy polyp at the base of the lesion, which can be performed via a trans-oral, trans-nasal, or trans-tympanic approach [7, 8]. The use of intraoperative endoscopy is useful for avoiding injury to the Eustachian tube. Although gross total resection can be safely achieved through an endoscopic minimally-invasive approach in cases that do not involve the middle ear [8]. However, the confined space of the Eustachian tube and proximity to the internal carotid artery can pose an operative challenge, which can be addressed by performing pre-operative imaging as well as doing a staged procedure. Therefore, a staged procedure may be

necessary to clear the nasopharyngeal component in order to urgently restore the airway, while minimizing the risk of vascular injury when the lesion abuts the carotid canal with a tenuous wall, such as in this case. The remaining stump can be resected at a later time.

Conflict of interest None.

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