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CT Versus MR: Still a Tough Decision 1
Asif Ahmad and Barton F. Branstetter IV

CT and MRI are the two most widely used imaging modalities for evaluating head and neck pathology. There is continued controversy in the literature about which modality is superior for imaging different areas of the head and neck. This article summarizes the literature supporting the use of CT, MRI, or both for specific clinical scenarios in otolaryngology. Familiarity with the benefits and potential pitfalls of each modality allows referring physicians and radiologists to tailor imaging regimens to the needs of individual patients.

Indications for PET/CT in the Head and Neck 23
Vikas Agarwal, Barton F. Branstetter IV, and Jonas T. Johnson

PET/CT has revolutionized the evaluation of patients with head and neck cancer by allowing more accurate staging, more focused treatment modalities, earlier detection of recurrent disease, and identification of incurable disease. In some clinical scenarios, PET/CT is clearly useful, while in others the cost may not be warranted. In this chapter, the authors review the literature on the use of PET/CT in head and neck cancers (in particular squamous cell carcinoma) and provide an evidence-based approach to the use of PET/CT for staging, treatment planning, monitoring of treatment response, and surveillance of treated patients with squamous cell carcinoma. They also briefly address the use of PET/CT for thyroid cancer, lymphoma, and melanoma. At the end of each section, key points are summarized in a box for quick reference.

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This article presents a systematic approach for interpreting a craniofacial CT scan that is clinically useful to the reconstructive surgeon. By categorizing the fracture patterns and highlighting the variables that may affect fracture management, the radiologist can expand his interpretation of the fracture pattern into a clinically useful diagnosis that may affect fracture management.

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The parapharyngeal space (PPS) is a space in the suprahyoid neck that contains fat and is surrounded by several other spaces defined by the fascial layers of the neck. This article presents the spatial anatomy of the PPS and describes the displacement patterns of the PPS fat that are essential for accurate diagnosis and appropriate treatment of pathology arising in this region.

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The unique and specialized structures of the oral cavity and jaws give rise to a myriad of diverse developmental, inflammatory, and benign lesions or conditions. This article reviews the imaging of common lesions and their variants, and reviews several rare but important lesions. Guidelines and algorithms for approaching the differential diagnosis are provided.

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Christine M. Glastonbury	

Imaging evaluation of laryngeal pathology has been revolutionized with the development of multidetector CT. The thinner axial CT slices result in improved contrast resolution and the ability to perform multiplanar reformations without breathing or swallowing artifacts. This article reviews the use of multidetector CT in the evaluation of laryngeal trauma and in common and uncommon inflammatory laryngeal diseases. The imaging evaluation of hoarseness and recurrent laryngeal nerve paralysis is reviewed with emphasis on where MRI or positron emission tomography can offer additional diagnostic information.

Imaging of Hearing Loss	157
Michele B. St. Martin and Barry E. Hirsch	

A wide range of pathology involving the external, middle, and inner ear contribute to conductive and sensorineural hearing loss.

Diagnostic imaging plays a critical role in the evaluation and management of hearing loss. High resolution computed tomography (CT) of the temporal bone and magnetic resonance imaging (MRI) are the preferred imaging modalities to evaluate the ear structures for causes of hearing loss, with the specific type of hearing loss and location of defect dictating which type of imaging is preferred. In general, the external auditory canal, middle ear space, mastoid, petrous apex, and otic capsule are best visualized with CT, whereas suspicion of retrocochlear pathology warrants MRI.

Imaging of Tinnitus

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Melissa Kang and Edward Escott

From a radiologic workup perspective, tinnitus is classified into pulsatile, which can be objective, and nonpulsatile, which is typically subjective. There is considerable discrepancy within the literature regarding the percentage of positive findings in patients with pulsatile tinnitus. The authors discuss the overlap in the radiographic findings detected in association with tinnitus in both asymptomatic patients and symptomatic patients and the importance for imaging to detect treatable causes. They discuss imaging related to diagnosis and treatment and provide an imaging workup algorithm.

Lesions and Pseudolesions of the Cavernous Sinus and Petrous Apex

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John F. Boardman, William E. Rothfus, and Harjot S. Dulai

Endoscopic surgery using an expanded endonasal approach now allows surgical access to an increasing range of parasellar, suprasellar, clivus, and petrous apex lesions. Accurate preoperative planning requires proper interpretation of CT and MRI results. It is essential to identify important anatomic landmarks and to recognize the appearance of common lesions and pseudolesions. Postoperative imaging must evaluate for residual tumors and identify iatrogenic conditions.

Preoperative and Intraoperative Imaging for Endoscopic Endonasal Approaches to the Skull Base

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Paul A. Gardner, Amin B. Kassam, William E. Rothfus, Carl H. Snyderman, and Ricardo L. Carrau

Endoscopic endonasal approaches are being used with increasing frequency to provide access to virtually any anterior cranial base, clival, or anterior craniocervical pathology. The radiographic evaluation of skull base anatomy and its relationship to associated tumors is critical for both preoperative planning and intraoperative guidance, to ensure the safety and efficacy of these techniques. CT and MRI play a complementary role in guiding endoscopic endonasal procedures.

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Laurie A. Loevner	

This article discusses the rationale and indications for image-guided fine needle aspiration and biopsy of a spectrum of head and neck masses, with an emphasis on CT-guided procedures in the suprahyoid neck. Preparation of patients before their appointment in the radiology department, obtaining informed consent, the technique and approaches, and postprocedural care are reviewed.

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