

Imaging of Head and Neck Emergencies



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KEYWORDS

• Emergency radiology • Head and neck infection • Imaging

KEY POINTS

- The anatomy of the head and neck contains very few structures that could be considered expendable and, consequently, is exceptionally intolerant to infection, inflammation, and injury.
- Acute pathologic processes in this body region, therefore, tend to result in significant suffering, functional impairment, or life endangerment if the diagnosis is missed or treatment is delayed.
- Many emergent processes within the cervical region also need to be considered for their possible impact on structures within the head and chest, into which there are many routes for potential communication.
- In the emergent setting, computed tomography (CT) is the favored imaging option because of its rapid image acquisition and superior delineation of the airway and osseous structures.
- On the other hand, MR imaging provides more robust information regarding complex soft tissue structures that may be difficult to distinguish on CT.
- However, any prolonged radiologic examination should only be undertaken in patients who possess a protected airway and are medically stable enough to tolerate the duration of the scan.
- This added step of preimaging clearance should entail a review of the patients' presenting symptoms and past medical history, which will also help to refine the study protocol and provide a clinical context in which to interpret the images.

INTRODUCTION: "CRIMES AGAINST ANATOMY"

If not for the thorough coverage of subject matter provided by the other articles of this book, the authors' one section, dedicated to various medical emergencies of the head and neck, may have read something like an endlessly long police report inspired by an episode of "Head and Neck Imaging's Most Wanted." Admittedly, there are many topics that would have been appropriate to include under this heading; but for the sake of brevity, the authors limit the discussion to the culprits that he found either most offensive or intriguing.

When one sits down to consider what actually constitutes an emergency in this region of the body, any of the following situations may qualify: (1) conditions that are life threatening, (2) conditions

that cause loss of function, (3) conditions that incite severe pain or distress, or (4) any situation that can lead to the aforementioned conditions if not identified early or acted on quickly. With that being said, it takes little imagination to see how just about any acquired abnormality of the head or neck has the potential for being declared an emergency on presentation; in reality, this is becoming increasingly more common, according to current fashions in modern clinical practice. It is important to keep in mind that, when dealing with the vital delicate anatomy of the head and neck, even minor violations can lead to serious disability and unnecessary suffering, especially when inaccurately interpreted or missed altogether. It is by the same token that relatively small transgressions may be promoted to the level of heinous criminal activity, should they occur in a sacred and vulnerable location.

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Take, for example, the act of littering in a nature preserve or smoking cigarettes in the Sistine Chapel (though from a head-and-neck standpoint, too, one should avoid smoking altogether).

In addition to the authors' coverage of head and neck emergencies, this article includes some of the necessary discussion about the relevant anatomy and imaging techniques, though mostly in the context of a specific disease process being presented.

APPROACH TO HEAD AND NECK IMAGING TECHNIQUES

Conventional radiography plays little role in the evaluation of patients with head and neck emergencies. The anatomic information provided is usually insufficient for diagnosing and managing these conditions (Figs. 1 and 2). Computed tomography (CT) remains the foremost radiologic tool for imaging the head and neck in the acute setting

(see Figs. 1 and 2; Figs. 3–8), given its many attractive features, which include: fast speed of image acquisition, large field of view (FOV), high spatial resolution, relative insensitivity to patient motion, ability to provide reformatted images from a single data acquisition, wide availability of the technology, and ease of technical use. In the emergent setting, these highly desirable properties should outweigh any concerns one may have about the long-term effects of radiation exposure, especially if one adheres to standard imaging practices and keeps track of CT dose reports (basic radiologic hygiene). Furthermore, the ongoing evolution of widely available low-dose reconstruction algorithms and improvements in detector technology continue to diminish the radiation cost of CT imaging. Of note, we must always take care not to let exuberant dose-limiting practices sacrifice vital diagnostic information from the scan; a safe scan by definition should not facilitate a radiologist in readily missing a critical finding.

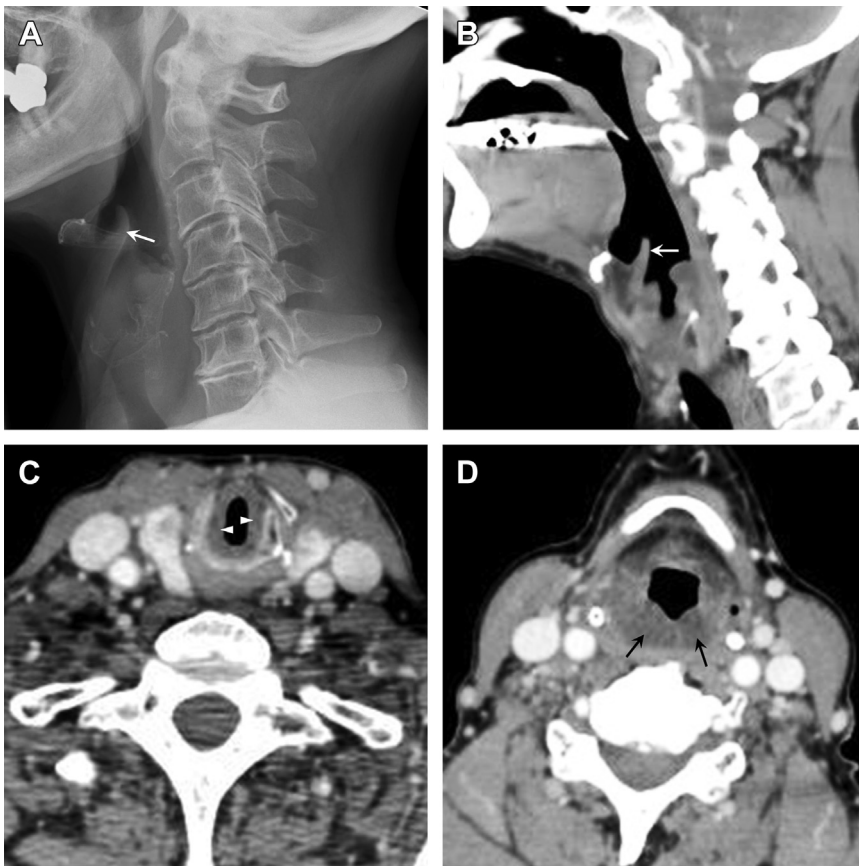


Fig. 1. Acute supraglottitis and laryngitis: (A) Lateral radiograph demonstrates enlargement of the suprahoid and infrahyoid epiglottis (*white arrow*). Sagittal (B) and axial (C, D) Computed tomography scans also reveal edema of the epiglottis (*white arrow*), aryepiglottic folds (*black arrows*), and mucosal lining of the subglottic larynx (*white arrowheads*).

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