Imaging for Headache
What the Otolaryngologist Looks for

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KEYWORDS

• Rhinogenic headache • Imaging • Contact-point headache
• Computed tomography • Otolaryngology • Sinusitis

KEY POINTS

- Rhinogenic causes of facial pain and headache in the absence of chronic or acute changes within the paranasal sinuses are challenging to identify strictly through imaging studies.
- Computed tomographic (CT) imaging findings of various degrees of paranasal sinus mucosal thickening may suggest a rhinogenic source for headaches and facial pain.
- CT findings suggesting a rhinogenic source of a headache often include subtle mucosal contacts, such as septal spurs or large lateral nasal structures.
- Anatomic variants that obstruct the outflow tracts of the paranasal sinuses, including reduction of the infundibular space, may also suggest a potential rhinologic source of facial pain.
- Identifying anatomic variants may help determine possible therapeutic procedures to treat a rhinogenic headache.

INTRODUCTION

The diagnostic criteria and standard of care for the management of acute, subacute, and chronic rhinosinusitis have been largely defined.[1–3] Embedded in these definitions are diagnostic imaging criteria that indicate mucosal disease within the paranasal sinuses.[1–3] These mucosal findings are elementary to identify, even for a non–head and neck trained physician or radiologist. Nonetheless, other rhinogenic sources of headache and facial pain have been debated in the literature and within rhinologic circles. These rhinogenic sources include mucosal contact-point headaches,

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Abbreviations	
ARS	Acute rhinosinusitis
CT	Computed tomography
FP	Facial pain
HA	Headache
HIV	Human immunodeficiency virus
OMC	Osteomeatal complex
RARS	Recurrent acute rhinosinusitis
TMJ	Temporomandibular joint
URI	Upper respiratory infection

barosinusitis, recurrent barotrauma, and recurrent acute rhinosinusitis (RARS). The diagnoses for these other potential sources may be challenging for clinicians because the patient may present with a normal examination or computed tomography (CT) scan between active episodes.[4,5]

In the absence of mucosal involvement, differentiating a rhinogenic from a nonrhinogenic source, such as a tension headache, migraine headache, temporomandibular joint disease, or cluster headaches through history and physical examination may be difficult. Imaging studies may only suggest a contact or obstruction point but are not hallmark to a particular rhinogenic headache diagnosis.[4–7] RARS poses a diagnostic dilemma in providing objective, radiographic findings in between acute episodes that can differentiate it from an upper respiratory infection.[6]

More complicated, and not covered in this review, are discussions regarding the potential of rhinogenic triggers that at least theoretically may elicit a classic cascade of physical events that lead to a migraine-variant–type headache.

This article focuses on CT findings associated with rhinogenic causes of headache and facial pain. These more advanced observations of CT scan variants will provide otolaryngologists with an additional tool besides clinical examination to diagnose and potentially treat rhinogenic headaches.

DEFINITIONS

Traditionally, rhinogenic headaches are defined as a headache or facial pain caused by a rhinologic source, yet this definition excludes classic acute and chronic sinusitis findings such as inflammatory sinonasal disease, nasal discharge, nasal polyps, nasal mass, hyperplastic mucosa, and tumors or foreign bodies.[8] This definition also excludes neurologic, neuromuscular, and vascular-type of headaches, including intracerebral causes, tension headaches, migraine headaches, temporomandibular joint disease, and cluster headaches. Mucosal contact-point headaches are a subset of rhinogenic headaches that are triggered by mucosal contact, most commonly from the lateral nasal wall to the septum.

According to the Rhinosinusitis Task Force, RARS is defined as 4 or more episodes of rhinosinusitis per year, but these episodes do not meet the duration criteria of more than 12 weeks to be considered chronic rhinosinusitis, and complete resolution of symptoms occurs between episodes.[1–3] Barosinusitis, whether active or recurrent, results in facial pain classically caused by descent from altitude or descent when diving.[9,10] When ventilation of the sinus outflow tract is inadequate or completely obstructed, a marked increase in pressure within the sinuses results in pain, and possibly mucosal inflammatory changes.