



# UNILATERAL ADULT-ONSET OTITIS MEDIA WITH EFFUSION—IS FLEXIBLE NASOPHARYNGOSCOPY ENOUGH?

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## ABSTRACT

**Objective:** Unilateral otitis media with effusion in an adult is a well-known harbinger of nasopharyngeal carcinoma. Emphasis is placed on the exclusion of this diagnosis due to its reputation for insidious onset. Endoscopic examination of the nasopharynx is imperative, but what if occult pathology exists despite a normal examination? The goals of this article are to 1) investigate the current common clinical practice for evaluation of adult-onset serous otitis media, and to 2) discuss consideration of earlier inclusion of radiological studies in the work-up of this condition in the case of a normal endoscopic nasopharyngeal examination.

**Methods:** Case series

**Results:** This series describes three adult patients who initially presented with a unilateral otitis media with effusion, the presence of which could not be explained by history or endoscopic nasopharyngeal examination. Imaging studies were ordered when symptoms either did not resolve or worsened. Each patient was found to have a different pathological process involving the parapharyngeal space and skull base. The time from initial presentation to diagnosis ranged from 5 months to 2 years.

**Conclusions:** Mass lesions in the parapharyngeal space and skull base can cause obstruction of the eustachian tube with minimal clinical findings other than a middle ear effusion. Therefore, we advocate consideration of early CT evaluation of the parapharyngeal space and skull base in the case of adult-onset otitis media with effusion with a normal endoscopic nasopharyngeal examination. A standard paranasal sinus CT is fast, relatively inexpensive, safe and can easily accomplish this goal.

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## INTRODUCTION

Adult-onset otitis media with effusion (OME) is a relatively common clinical condition encountered by an otolaryngologist. It is most commonly a result of allergic disease, adenoid hypertrophy or rhinosinusitis<sup>1</sup>. The most feared cause, albeit rare, is by a mass lesion in the head and neck which either physically obstructs the eustachian tube, or interferes with the function of its surrounding musculature<sup>2</sup>. Much of the available literature in regards to adult-onset OME pertains to the diagnosis or exclusion of nasopharyngeal carcinoma (NPC). Between 26-46% of patients with NPC have OME at diagnosis, but it is rarely the sole presenting symptom<sup>3</sup>. Early recognition is important because curability falls from 80% to 20% when disease advances from a localized state in the nasopharyngeal mucosa<sup>4</sup>. It is important to emphasize that OME is a physical sign, not a disease in itself. Its presence suggests to the clinician that the eustachian tube (ET) is either physically obstructed or is otherwise not functioning properly.

In 1994, Finkelstein et al<sup>1</sup> outlined a clinical approach to adult-onset OME. It begins with complete endoscopic examination of the nasal cavity and nasopharynx, with proper interventions undertaken based on what is observed including treatment of the effusion. In the event of a normal nasopharyngeal examination at the time of presentation, and with no apparent cause for the effusion, the authors advocate to proceed with a CT scan of the skull base, nasopharynx, eustachian tube, and paranasal sinuses<sup>1</sup>. In common clinical practice, however, most clinicians would not proceed directly to CT given the perceived cost and radiation exposure associated with the procedure and the relatively low incidence of a neoplastic cause of an isolated OME. This more conservative approach has been advocated in the NPC literature<sup>3,5</sup>, with one author advocating that new higher resolution endoscopes allow for excellent visualization of the nasopharynx in the outpatient setting and that close observation would be sufficient in the absence of findings on initial endoscopic exam<sup>5</sup>.

The following section illustrates three cases of adult-onset unilateral OME all with no apparent nasopharyngeal pathology on initial physical examination. These patients were later found to have mass lesions extending to the skull base, which caused compression of the ET. Diagnosis was not made until imaging studies were eventually ordered due to worsening symptoms.

## CASE 1

The first patient is a 23 year old female, who initially presented for conductive hearing loss in the right ear with aural fullness. A unilateral serous otitis media was noted on physical exam. Fiberoptic endoscopy revealed a normal nasopharynx. Over the course of her treatment, she received three sets of PE tubes over an 18 month period with initial relief of symptoms and improvement of hearing loss, but symptoms would return after extrusion of the PE tube. She was then lost to follow-up for one additional year, when she presented with intermittent right-sided epistaxis with a polypoid mass noted in right posterior lateral nasal cavity. CT with contrast and MRI subsequently revealed a large mass with involvement of the right infratemporal fossa, pterygomaxillary fissure, pterygopalatine fossa and sphenopalatine foramen, with multi-foraminal and intracranial extension. Her MRI is shown in Fig 1. Biopsy confirmed the diagnosis of adenoid cystic carcinoma. She was treated with definitive chemotherapy and radiation.

## CASE 2

The second patient is a 49 year old male, who initially presented for a two month history of left ear pain, fullness, and persistent effusion which had been refractory to medical management. Fiberoptic endoscopy revealed no nasopharyngeal masses. He was treated with a myringotomy which provided immediate relief of his symptoms. Two months later, the effusion re-accumulated and a PE tube was placed in clinic. The nasopharynx was examined again and was, once again, normal. Five months after initial presentation, pt experienced left maxillary sinus pressure and TMJ pain with trismus. This time, nasal endoscopy revealed a slight fullness in the left lateral nasopharynx with normal appearing overlying mucosa. CT and MRI revealed a mass that involved both the left parapharyngeal space and masticator space, deep lobe of the parotid gland and extension through the left foramen ovale. Biopsy confirmed the diagnosis of a T4 undifferentiated carcinoma believed to originate from the left parapharyngeal space. The total time between initial presentation and diagnosis was eight months. He was treated with definitive chemotherapy and radiation.

## CASE 3

The third patient is a 32 year old female, who initially presented for left ear pain, muffled hearing, and aural fullness. Fiberoptic nasal endoscopy revealed a normal appearing nasopharynx. A myringotomy was performed in clinic with immediate relief of symptoms. Pt returned to clinic one month later after an upper respiratory tract infection, which caused her symptoms to return. She, once again, had a normal nasopharyngeal examination. At that time a PE tube was placed on the left side, once again with immediate relief of symptoms. She subsequently experienced essentially constant otorrhea along with worsened TMJ pain and trismus, which prompted a radiological investigation. Imaging studies revealed a large mass originating in the masticator space which effaced the parapharyngeal space and extended to the skull base expanding the foramen ovale and spinosum. Several biopsies failed to provide a diagnosis. Roughly one year after initial presentation, a left maxillectomy was performed for incisional biopsy and the diagnosis of idiopathic pseudotumor was made.

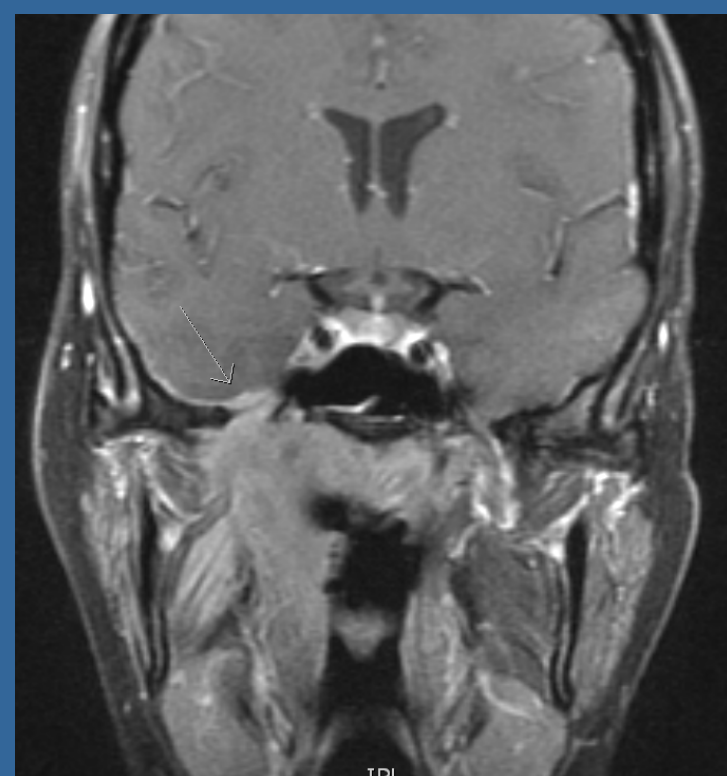


Figure 1: Case 1

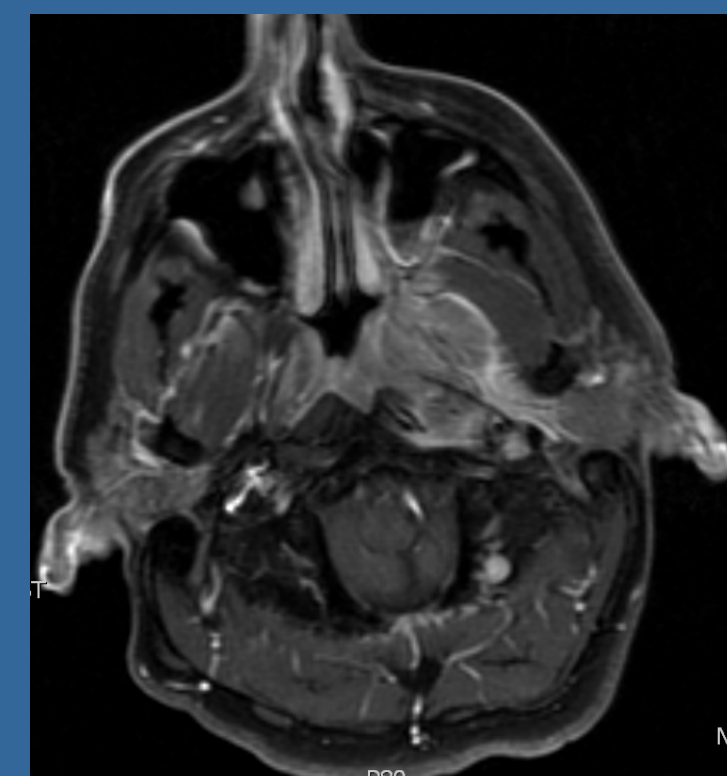


Figure 2: Case 2

## DISCUSSION

All three patients in this series presented with an isolated unilateral OME with a normal nasopharyngeal examination. All three were later found to have a parapharyngeal space/infratemporal fossa lesion as a cause for the effusion. The time to diagnosis in these three cases ranged from 5 months to 2 years.

Thorough endoscopic examination of the nasal cavity and nasopharynx is an essential portion of the initial evaluation of unilateral adult-onset OME. The origin of the pathology, however, may not be from the nasopharynx, and endoscopic diagnosis of a parapharyngeal space tumor would be impossible in the early stage<sup>1</sup>. If the examination is normal, what is the next step? In light of these three cases and others previously published in the literature one must consider incorporating the use of a screening CT scan at initial presentation in the case of an unexplained adult-onset unilateral OME with a normal nasopharyngeal examination.

A series written by Facer et al<sup>6</sup> in 1980 examined 4 “unusual causes” of unilateral OME (two non-keratinizing squamous cell carcinoma of the ET, two neurilemmomas of the nasopharynx) with a delay in final diagnosis ranging from 1.5-8 years. All four had extensive repeated examinations with no physical explanation for their effusions. The author reinforced the idea that some of the regional causes of OME may not be apparent on the first, second or even third examination of the patient.

As Otolaryngologists, a non-contrast paranasal sinus CT is a very familiar study. Over the last 15-20 years, prices for imaging with CT have greatly decreased and image resolution has greatly increased. High resolution sinus CT scans can now be performed in a matter of seconds<sup>7</sup>, and could potentially identify occult pathological processes along the course of the ET when large enough to cause external compression and obstruction of the ET. It should also be noted that the use of a low-dose spiral CT technique to evaluate the paranasal sinuses allows the effective radiation dose to be reduced to the order of a chest radiogram<sup>8</sup>. If the CT scan is normal, this study also serves as a baseline should symptoms persist.

Using data from a previously mentioned study<sup>1</sup>, the incidence of isolated OME with a normal nasopharyngeal exam can be investigated. This cohort consists of 167 patients with adult-onset OME followed prospectively. Only 5 of 167 (3%) had both a normal nasopharyngeal examination and no history to suggest a cause for the effusion such as rhinosinusitis, recent URI, allergic symptoms, etc. Two patients were eventually found to have parapharyngeal space schwannomas by CT. The cause of the remaining three cases remained undetermined despite evaluation with a CT scan. Based on this data, five CT scans would have been ordered at initial presentation for unexplained serous otitis media, two of which could have potentially resulted in an earlier diagnosis of parapharyngeal space mass lesion. One would assume based on the size and extent of the lesions discovered in our series that a screening CT scan would have easily discovered all three before the onset of more ominous symptoms.

## DISCUSSION

Comparisons can be made with screening for acoustic neuromas. An unexplained unilateral serous otitis media is analogous to asymmetric sensorineural hearing loss (SNHL) in that it is a physical finding that demands further investigation. MRI with gadolinium is the gold standard for diagnosis of acoustic neuroma. Despite its price, MRI has been recommended as a first-line investigation for asymmetric SNHL<sup>9</sup> due to risk of post-treatment morbidity and cost associated with tumor size at diagnosis. Perhaps a screening CT scan at initial presentation of unilateral otitis media could diagnose a parapharyngeal space/skull base mass before the occurrence of intracranial extension, for example.

In conclusion, mass lesions in the parapharyngeal space can cause obstruction of the ET with minimal clinical findings other than OME. Modern day CT is more affordable, has higher resolution, and is a much faster test to perform than in years past. Therefore, we advocate the use of a standard non-contrast paranasal sinus CT at initial presentation in cases of unexplained adult-onset unilateral OME with normal nasopharyngeal examination. If the initial CT is normal, it will serve as a baseline for comparison if the condition does not resolve after symptomatic treatment. Another CT scan should be obtained for 6 months of persistent symptoms despite adequate management. There is evidence in the Otolaryngology literature to support an early CT scan in this situation, however, common clinic practice does not reflect this. A paranasal sinus CT can evaluate the eustachian tube in its entirety and could potentially identify a parapharyngeal space/skull base mass lesion earlier in the disease course.

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