

Mucocele in an Onodi cell with simultaneous bilateral visual disturbance

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Abstract

The Onodi cell is a large pneumatized posterior ethmoid cell and closely related to optic nerve. We present an extremely rare case of retrobulbar optic neuropathy caused by mucocele in an Onodi cell. A 79-year-old man complained of headaches and simultaneous bilateral visual disturbance. A computed tomography (CT) scan demonstrated a mucocele in an Onodi cell, which involved bilateral optic nerves. The surgical treatment with a transnasal endoscopic approach was performed, resulting in the improving of visual acuity. The bilateral optic nerves were identified along each lateral wall into an Onodi cell accompanied with bone defect. In an Onodi cell, even if the lesion is isolated and/or small, it may be closely related to ocular symptoms. Imaging studies should be considered for the differential diagnosis because early diagnosis and prompt surgical treatment for mucocele are needed for recovery of visual impairment.

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1. Introduction

The ethmoid sinus is a complex series of multicellular expansions. The basal lamella of the middle turbinate divides the anterior ethmoid cells from those of the posterior ethmoid. The anterior ethmoid cells are related to the anterior half of the medial wall of the orbit, while the posterior cells are related to the posterior half of the orbit, particularly the optic nerve. Therefore, lesions in the posterior ethmoid cells are frequently associated with ocular symptoms, such as visual loss, visual field defects, proptosis, and extraocular palsies rather than nasal symptoms. Among posterior ethmoid cells, the Onodi cell is a large pneumatized posterior ethmoid cell that pneumatizes laterally and superiorly to the sphenoid sinus. Therefore, the optic nerve may be exposed along the superior lateral wall [1–4]. Due to this close relationship between the Onodi

cell and the optic nerve, the Onodi cell is considered one of the most important structures to be identified before surgery. Alternatively, a mucocele is a chronic, expansive, and cystic lesion limited by the mucosa of the paranasal sinus. Most mucoceles often occur in the frontal and anterior ethmoid sinus rather than the posterior ethmoid and sphenoid sinus. To date, there have been a few reports of mucocele in an Onodi cell in our review of the literature [5–7].

Herein, we describe a patient with mucocele in an Onodi cell associated with simultaneous bilateral visual disturbance and the necessity of imaging studies for the differential diagnosis.

2. Case report

A 79-year-old man had sudden onset of frontal headache, nausea, and bilateral decreased vision. Since his symptoms progressed thereafter, he was referred to the neurology department of our hospital. His medical history was

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noncontributory except for glaucoma. Ophthalmic examination showed that visual acuity was limited to light perception only in both eyes. After his visual acuity had been improved with methylprednisolone pulse therapy, visual acuity was 0.6 in the right eye and 0.4 in the left eye. Computed tomography (CT) scan and magnetic resonance imaging (MRI) had been performed and showed normal brain. However, an isodense, oval-shaped lesion was detected in the posterior ethmoid sinus. Therefore, he was referred to our department. On physical examination, the head and neck were unremarkable except for nasal examination. The septum was not deviated. Nasal endoscopic examination showed a bulging lesion with rubor from the posterior of right middle turbinate, but there were no inflammatory changes, such as edema, polyps, or sign of purulence. There were no masses noted in the nasal cavity or nasopharynx. Of note, he had no history of chronic sinusitis or sinus surgery. For further characterization of the lesion in posterior ethmoid cells, axial and coronal CT scans were performed, and sagittal sections were also obtained by reconstitution, demonstrating a dense homogenous mass in posterior ethmoid cell located superior to the sphenoid sinus (Fig. 1). In addition, the mass extended inferiorly and laterally around the bilateral optic nerves (Fig. 2). A diagnosis of mucocele in the Onodi cell was made. The patient underwent endoscopic sinus surgery and marsupialization of the mucocele involving the Onodi cell under general anesthesia. Briefly, the endoscopic approach was performed through the right nasal cavity. A bulging lesion from the posterior of right middle turbinate identified was punctured and mucous secretion under pressure was drained. Therefore, this bulging lesion formed anterior wall of mucocele was removed using straight ethmoid punch and its content of thick secretions was suctioned. Thus, the opening was enlarged sufficiently, and then endoscopic sphenoidotomy was also performed. The mucocele was filled with sterile mucous secretions. As shown in Fig. 3, the bilateral

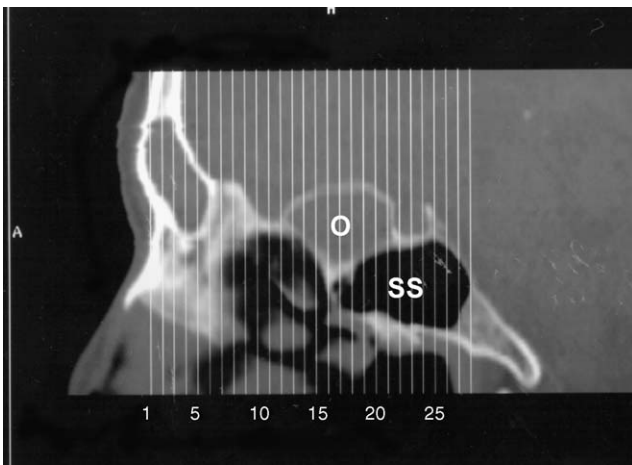


Fig. 1. Sagittal CT showing a homogenous mass in an Onodi cell located superior to the sphenoid sinus. Onodi cell (O) and sphenoid sinus (SS).

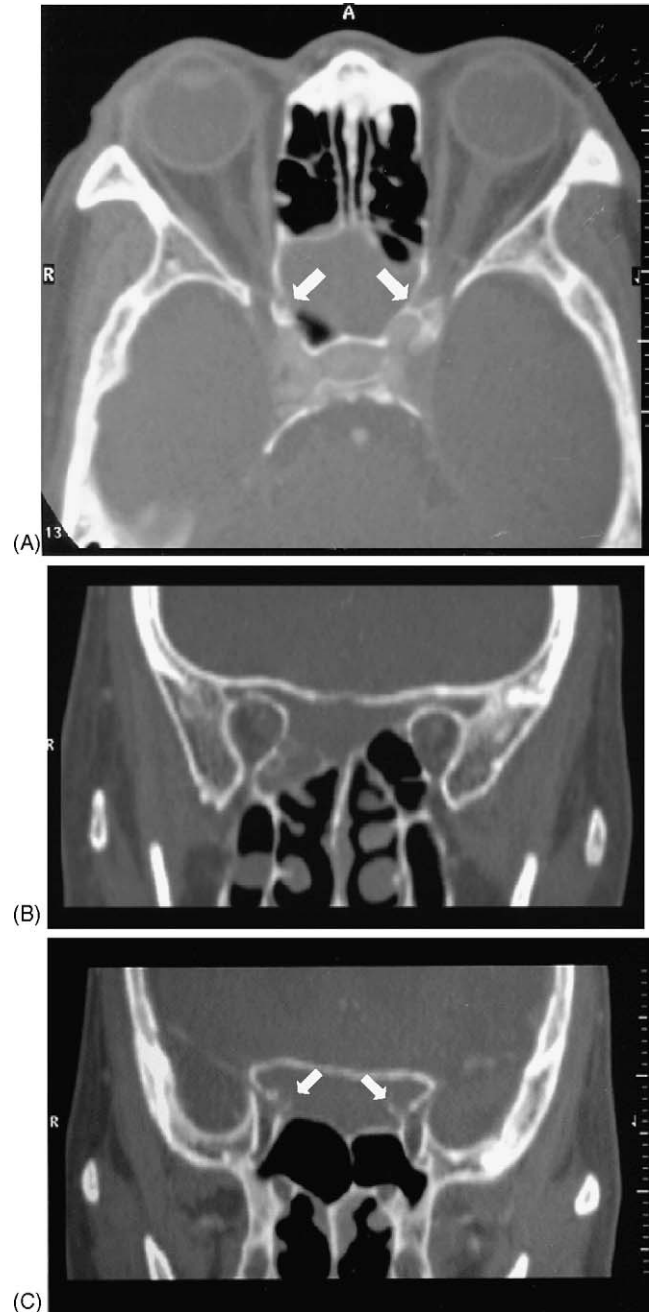


Fig. 2. Axial CT showing a mucocele in an Onodi cell compressing the bilateral optic nerves (A). Coronal CT showing a mucocele extended inferiorly with bulging (B). Note that on coronal images the bilateral optic nerves appear to course through the mucocele (C). Optic nerves (white arrows).

optic nerves were identified along each lateral wall accompanied by bone defect, and the mucosa in the cell was congested and edematous. Further steroid therapy was performed, and finally, visual acuity was considerably restored; visual acuity was 0.9 in the right eye and 0.8 in the left eye. Thus, endoscopic sinus surgery was sufficiently effective for restoration of visual impairment, as reported by other groups [8,9]. A CT scan performed at 10 days after

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