Sphenoid Sinus Mucocele Presenting with Isolated Oculomotor Nerve Palsy

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Abstract

Isolated sphenoid sinus mucoceles are rare. Patients who have these lesions can present with several different symptoms and signs such as headache, nasal symptoms, and cranial nerves 2, 3, 4, and 6 palsies. Isolated oculomotor nerve palsy is not a common presenting symptom of sphenoid sinus mucocele. However, exclusion of sphenoid sinus mucocele should be made when the patient presents with isolated oculomotor nerve palsy. A case of sphenoid sinus mucocele with isolated oculomotor nerve palsy is presented with review of the literature. The oculomotor nerve function in this patient completely recovered after endoscopic sphenoidectomy.

Key word : Sphenoid Sinus, Mucocele, Oculomotor Nerve Palsy

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Mucoceles of the paranasal sinuses usually occur in the frontal and ethmoid sinuses[1]. Isolated sphenoid sinus mucoceles are rare. Patients who have these lesions can present with many different symptoms and signs such as headache, nasal symptoms, and cranial nerves 2, 3, 4, and 6 palsies (in isolation or combination)[2]. The most commonly involved cranial nerve is the optic nerve leading to sudden or progressive loss of vision[2,3]. Oculomotor nerve ranks the second but it is the most commonly affected cranial nerve causing diplopia[2,3]. There is often associated optic nerve involvement; however, isolated oculomotor palsy is rare[3]. We present a case of sphenoid sinus mucocele presenting with isolated oculomotor nerve palsy which completely recovered gradually after endoscopic sphenoidectomy.

CASE REPORT

A 61-year-old female patient presented with a four-day history of drooping of the left upper eyelid and diplopia. She also had had progressive

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headache, nausea and vomiting for three months. She had no other underlying diseases. Physical examination revealed an acutely ill woman with normal vital signs. She was unable to look downward, upward, and inward beyond the midline with her left eye. However, her left pupil was not dilated and reacted normally to light. Visual fields, fundi and other cranial nerve function were normal. A small polyp was visualized in the left sphenoethmoid recess, whereas, the right sphenoethmoid recess was normal. A CT scan showed a soft tissue mass expanding the sphenoid sinus and pituitary gland. MRI showed a large rim enhancing hyposignal T1, hypersignal T2 lesion occupying and ballooning the whole sphenoid sinuses. The pituitary gland, cavernous sinuses and carotid arteries were normal. A diagnosis of sphenoid sinus mucocele was made and endoscopic transnasal sphenoidectomies were performed on both sides under local anesthesia in order to decompress the mucocele. A large amount of yellow viscous mucous fluid escaped when the anterior wall of the sphenoid sinus was opened. The mucosa of both sphenoid sinuses was found to be swollen. There was no sphenoid septum separating both sphenoid sinuses. The anterior walls of both sphenoid sinuses were widened to 1.5 centimeter in diameter and lightly packed with small pieces of microfibrillar collagen.

The following day, the patient had no further headache, so she was discharged from the hospital the day after and was followed up as an outpatient. Her oculomotor nerve function recovered ten days postoperatively and eventually returned to normal in five months.

Fig. 1. Axial MRI showing a large lesion occupying and ballooning the whole sphenoid sinuses.

DISCUSSION

Mucoceles, regardless of the sinus origin, are commonly defined as the accumulation and retention within the paranasal sinuses of their secretion due to obstruction of their ostia from any lesion. Most mucoceles occur in the frontal and ethmoid sinuses[1]. Sphenoid sinus mucoceles represent only one per cent of all paranasal sinus mucoceles[1] and about 24-29 per cent of all isolated sphenoid sinus lesions[4,5].

Sphenoid sinus mucocele was first identified by the anatomist Rouge in 1872 during a routine cadaver dissection. Berg, in 1889 was the first to describe an isolated sphenoid mucocele[6] and since then there have been increasing numbers of case reports of sphenoid sinus mucoceles.

Symptoms and signs of sphenoid mucoceles are directly related to sphenoid sinus anatomy and its contiguous structures. Surrounding the sphenoid sinus are at least thirteen vital and vulnerable structures including the dura mater, pituitary gland, cavernous sinus, internal carotid artery, optic nerve and chiasm, oculomotor nerve, trochlear nerve, ophthalmic nerve, maxillary nerve, abducens nerve, sphenopalatine ganglion, sphenopalatine artery, and the pterygoid canal and its nerve[7]. The common symptoms and signs are headache, nasal symptoms, and cranial nerves 2, 3, 4, 6 palsies. Nasal symptoms, most commonly presented in all paranasal sinus diseases, are present in only fewer than half the cases when the disease is limited to the sphenoid sinus[2,3].

The most common presenting symptom is headache, which is present in about 60-70 per cent of cases[2,5]. Headache is typically retroorbital or frontal[2,8], is accentuated when the patient bends forward[5], and tends to be worse towards evening[8].

The second most common symptom is visual disturbance[5] resulting from involvement of cranial nerves 2, 3, 4, and 6 in isolation or combination. Optic nerve involvement leading to sudden or progressive loss of vision is the most common cranial nerve involvement[2,3]. It presents in about 57-65 per cent of cases[2,3].

Diplopia resulting from involvement of the voluntary ocular muscles occurs in 30 to 50 per cent of cases[2,3]. Of these, the oculomotor nerve

is involved more frequently than the trochlear and the abducens nerves. It occurs in about 19 to 37 per cent of cases[2,3]. There is often associated optic nerve involvement but isolated ocolomotor palsy is rare[3]. Compressive lesions to the oculomotor nerve preferentially damage the rim of the nerve, where the pupillary fibers travel, while ischemic palsies affect the core[9]. In this case and in the majority of other cases[3], the pupillary response was normal. Then oculomotor nerve palsy should not be caused by direct pressure on the nerve, but that the pressure of the mucocele disturbed the circulation in the nutrient vessels and that an ischemic neuropathy was responsible for the palsy[3]. Another theory for pupillary sparing is selective compression of the superior division of the oculomotor nerve. The oculomotor nerve divides into a small superior and a large inferior division in the anterior part of the cavernous sinus. The superior division innervates the superior rectus and the levator palpebrae muscles while the inferior division innervates the medial rectus, the inferior rectus, the inferior oblique muscles, and through its branch to the ciliary ganglion, innervates the sphincter pupillae and ciliary muscle[10]. But in the latter theory, the function of the medial rectus, the inferior rectus, and the inferior oblique muscles have to be normal.

Treatment of the sphenoid sinus mucocele is always surgical. Various approaches have been used but all were aimed at establishing adequate drainage of the mucocele by creating a substantial opening in its anterior wall. The endoscopic intranasal sphenoid approach affords outstanding visualization and a safe, straightforward approach to the sphenoid sinus, avoiding any possibly complications resulting from other approaches (such as septoplastic, antral, external sphenoethmoid, and extensive intranasal approaches)[11]. The sphenoid sinus can be entered *via* the posterior ethmoid sinus, its natural ostium, or its anterior wall. In this case, we performed the sphenoidectomy by entering its anterior wall at the point about one centimeter above the posterior choanal arch.

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มิวโคซีลของโพรงสฟีนอยด์มาพบแพทย์ด้วยอาการประสาทสมองคู่ที่สามเป็นอัมพาตเส้นเดียว

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มิวโคซีลของโพรงสฟีนอยด์เป็นโรคที่พบได้น้อย ผู้ป่วยอาจมาพบแพทย์ด้วยอาการหลายอย่างเช่น ปวดศีรษะ อาการทางจมูก หรือประสาทสมองคู่ที่ 2, 3, 4, หรือ 6 เป็นอัมพาต แต่ผู้ป่วยที่มาพบแพทย์ด้วยอาการประสาทสมองคู่ที่ 3 เป็นอัมพาตเส้นเดียวพบได้น้อย รายงานฉบับนี้ได้รายงานผู้ป่วยมิวโคซีลของโพรงสฟีนอยด์ที่มาพบแพทย์ด้วยอาการประสาทสมองเส้นที่ 3 เป็นอัมพาตเส้นเดียว ซึ่งหายเป็นปกติหลังการผ่าตัดโพรงสฟีนอยด์ผ่านทางจมูกโดยใช้กล้องเอ็นโดสโคป

คำสำคัญ : โพรงสฟีนอยด์, มิวโคซีล, ประสาทสมองคู่ที่ 3 เป็นอัมพาต

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