SPHENOID MUCOCELE: DETECTION AND SURGERY BY INTRANASAL ENDOSCOPY

C T Lim, L E Loh

ABSTRACT

Sphenoid sinus mucoceles are uncommon and difficult to diagnose clinically owing to the inaccessibility of the sphenoid sinus to clinical examination. A case of infected sphenoid mucocele in which the patient complained of chronic sore throat and in which routine intranasal endoscopy contributed significantly to the diagnosis is presented. The pathology of mucocele and endoscopic sinus surgery as the treatment for sphenoid sinus mucocele is discussed.

Keywords: Endoscopic Sinus Surgery, Intranasal Endoscopy, Mucocele, Paranasal Sinuses, Polyps, Pyocele.

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INTRODUCTION

A paranasal sinus mucocele is an encapsulated mass within a sinus containing mucoid secretions with desquamated epithelium and causing distension of the sinus walls. The mucoperiosteum of the sinus forms the wall of the cyst. When infected, it is termed a pyocele. Paranasal sinus mucoceles are most commonly found in the frontal sinus followed by ethmoid sinus. Mucoceles of the sphenoid sinus are rare. From 1872, when sphenoid mucocele was first described by Rouge, up to 1989, only about 150 cases have been reported in the medical literature[1].

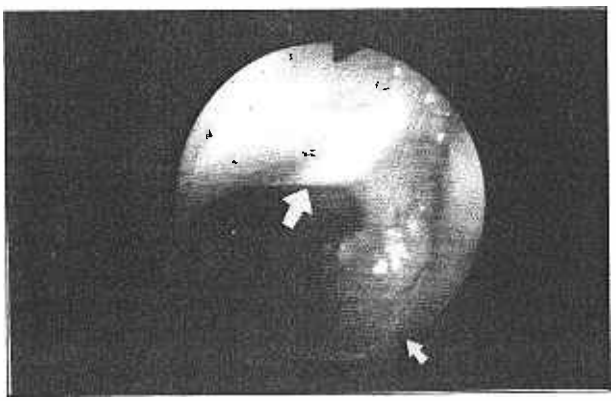
The presenting symptoms and signs of sphenoid sinus mucocele are related to its anatomical position as well as its adjacent structures[1]. Headache is the most common symptom. Ophthalmic disorders, cranial nerve deficits, nasal blockage and rhinorrhea are the other frequent presentations. With the use of intranasal endoscopy, sphenoid sinus disorder can be picked up at an earlier stage.

The treatment of sphenoid sinus mucocele is surgery. Traditionally, the approach to the sphenoid sinus is by septal, antral, ethmoidal, intranasal or intracranial routes. All these approaches carry significant morbidities. Since the introduction of endoscopic sinus surgery, the use of intranasal endoscope for surgery on the sphenoid sinus has been widely advocated as the surgical treatment of choice[1].

CASE REPORT

A 27-year-old Chinese man presented with daily throat irritation and dry cough for one year. No other relevant details could be obtained in the history. On examination, his general condition was satisfactory. Inspection of his anterior nasal spaces with the Thudichum speculum and the posterior nasal space with a mirror did not reveal any abnormality. However, intranasal flexible endoscopy under topical cocaine anaesthesia revealed polyps on the right anterior wall of the sphenoid and a stream of mucopus trickling down the left anterior sphenoidal wall to the posterior choana (Fig 1). The structures on the lateral nasal walls and the larynx were normal. Sphenoidal sinusitis was provisionally diagnosed based on the symptomatology and the endoscopic findings. Plain radiographs of the sinuses demonstrated an expanded opaque sphenoid sinus (Fig 2). The other paranasal sinuses were normal. Coronal CT scan of the sinuses showed a homogenous lesion with medium attenuation in the right sphenoid sinus (Fig 3). The sphenoid septum bulged into the left cavity in which an air-fluid level was present. The polyps in the right sphenoethmoidal recess originated from the posterior ethmoidal sinus and were lying immediately anterior to the sphenoid sinus (Fig 4). The other paranasal sinuses were normal.

Fig 1 - Endoscopy of the left posterior choana showing the stream of mucopus flowing down the anterior wall of the sphenoid sinus (large arrow). The left Eustachian tube is indicated by the small arrow.



The patient was diagnosed to have a mucocele in his right sphenoid sinus. The cause was most probably secondary to an obstruction of the ostium. Whether the polyps were the cause of the mucocele or the result of the mucocele is debatable. The mucocele was probably infected as manifested by the trickle of mucopus seen on endoscopy. The collection of fluid in the left sphenoid cavity was probably secondary to the mucocele because there was no radiological evidence of diseases in the other paranasal sinuses on the left side. The continual trickle of mucopus from the left sphenoid ostium irritated his pharynx and upper airway leading to the symptoms of persistent dry cough and throat irritation.

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Fig 2 - Plain radiograph of the sinus showing an expanded sphenoid sinus with an opaque cavity (indicated by star).

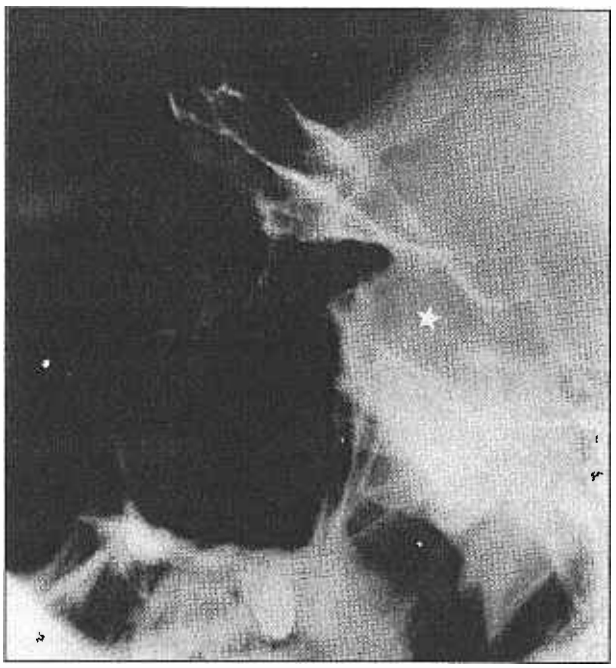
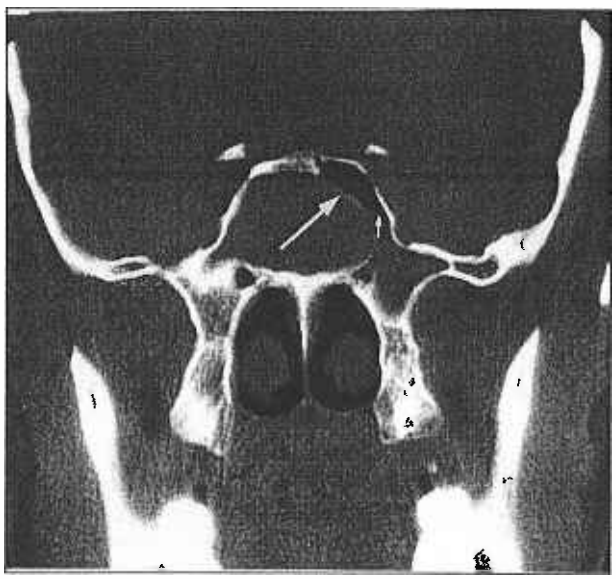


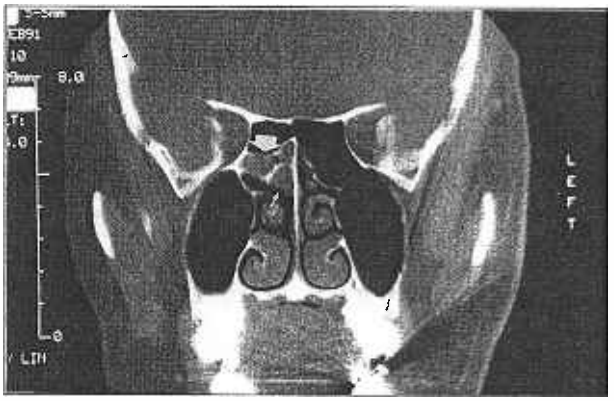
Fig 3 - Coronal CT scan showing the mucocele in the right cavity of the sphenoid sinus. The septum of the sphenoid was displaced to the left (long arrow). An air-fluid level was present in the left cavity (short arrow).



Surgery

Endoscopic sphenotomy drainage was performed to drain the mucocele. The patient was put under general anaesthesia and placed in a supine position. Both nasal cavities were cocainised with cotton patties soaked in 10% cocaine. Zero degree rigid nasoscope was used for visualisation. The access was improved by out-fracturing the middle turbinates. The polyps from the posterior ethmoid were removed. Each sphenoidal ostium was identified and probed. Blakesley Wilde nasal forceps with up-turned blades was used for the fenestration of both sphenoidal ostia. The forceps was introduced paraendoscopically and opened. One of the blades pointing downwards was insinuated into each ostium which was thus enlarged by biting off part of the anterior wall in piecemeal. The right cavity was filled with curdy debris which was removed. Mucopus was present in the left cavity. Probing the sphenoid cavities with a curved suction tube revealed a large defect in the sphenoidal septum. Nasal packing was done and removed on the second postoperative day. The patient was started on decongestant medication as well as topical steroid. He was reviewed regularly for endoscopic nasal toilet. On a review four months later, the patient had no more symptoms. Endoscopy did not reveal any mucopus. The sphenoid fenestration on the left could be visualised and was patent. The right sphenoethmoidal recess could not be examined endoscopically because of adhesions between the right middle turbinate and the nasal septum. Histology of the excised polyps showed inflammatory polyps.

Fig 4 - Coronal CT scan of the sinuses showing the polyps in the right sphenoethmoidal recess (small arrow) originating from the opaque right posterior ethmoidal sinus (fat arrow).



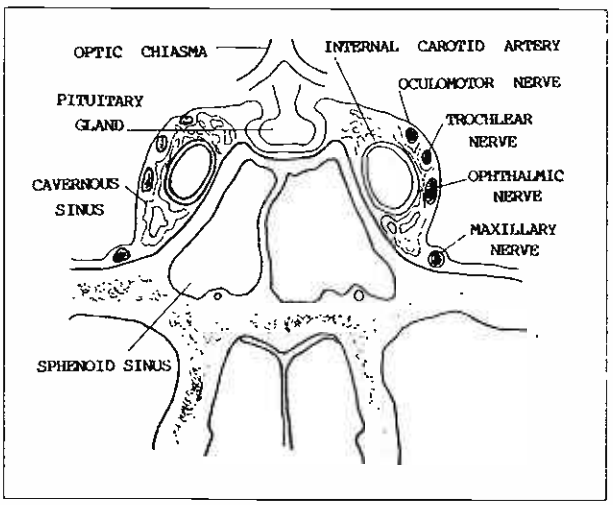
DISCUSSION

The sphenoid sinus is a rudimentary cavity at birth. It enlarges as the child grows and matures in the early teens. In adult, its average size is 14 X 14 X 12 mm. Its ostium is located on the anteriomedial wall just lateral to the vomer of the nasal septum at the level of the superior turbinates. The sphenoid sinus cavity is usually divided by a midline septum which is often asymmetrical and maybe incomplete[1].

There are several important anatomical structures located adjacent to the sphenoid sinus. These structures may be compressed by an expanding sphenoid sinus mucocele. The relationship of these structures to the sphenoid sinus is illustrated in Fig 5[2].

Sphenoid mucocele may be found in patients as early as in the second decade of life and up to the seventh decade. The pathogenesis of paranasal sinus mucocele is uncertain and is believed to be multifactorial. Three mechanisms have been put

Fig 5 - The anatomical relationship of the sphenoid sinus



forward: ostium obstruction, secretory duct obstruction and submucosal edema. The most common mechanism is ostium obstruction due to chronic infection, polyposis, tumour, and previous surgery. Obstruction to the duct of a secretory gland will result in a retention cyst which may expand into a mucocele. Submucosal edema due to allergic inflammation can cause ostium blockage with mucocele formation[1,3,4]. In our patient, the posterior ethmoidal polyps protruding into the sphenoethmoidal recess might be the cause of the sphenoid sinus mucocele by obstructing the ostium. As the sphenoid sinus mucocele expands, it spreads along the path of least resistance into the posterior ethmoidal sinus. Such mucocele is termed sphenoethmoidal mucocele. It also distends the walls of the sphenoid sinus and compresses on the adjacent structures shown in Fig 5.

Diagnosis of sphenoid sinus disease may pose problem because of its rarity and the relative inaccessibility to clinical examination. Headache, located at the retro-ocular or temporoparietal regions, is the most common presenting symptom. Ocular disturbances comprising internal and external ophthalmoplegia, visual deficit, unilateral exophthalmos can occur. Compression of the divisions of trigeminal nerve may cause secondary neuralgia and present as facial pain. Otolaryngic symptoms of nasal obstruction and rhinorrhea are seen in about 50% of the patients[3,5].

Intranasal endoscopy has been shown to be highly accurate in the diagnosis of sinusitis. In a prospective study by Nass et al, out of 50 patients with history consistent with chronic sinusitis who failed to respond to medical management and would not have been considered surgical candidates using traditional means, 30 were diagnosed to have surgical sinus disease using a combined investigative modalities comprising intranasal endoscopy and computerised tomography. Out of these 30 patients, 28 were found to have ostiomeatal unit disease on endoscopic work-up, giving a diagnostic accuracy of 93%[6]. In this case, the patient presented with a chronic cough and throat irritation for one year. He did not have any nasal symptom pertaining to his paranasal sinus disorder or other complaint to suggest a sphenoid mucocele. Intranasal endoscopy was done to exclude a sinogenic cause of his pharyngeal symptoms. The endoscopy revealed features of sphenoethmoidal sinus disease which were polyps in the right sphenoethmoidal recess and a stream of mucopus flowing down from the sphenoethmoidal recess to the posterior choana on the left side of the nose. These two endoscopic signs could not be seen on the indirect posterior rhinoscopy with the mirror. Based on the endoscopic findings, the patient was investigated further with radiography which revealed the diagnosis.

The sphenoid sinus mucocele must be distinguished from neoplasms arising from the pituitary region. One must consider craniopharyngioma, meningioma, glioma, intracranial cordoma, cholesteatoma, pituitary gland tumour and nasopharyngeal carcinoma as the differential diagnoses. Radiological evaluation can differentiate these lesions from sphenoid sinus mucocele. Radiologically, a chromophobe adenoma is most likely to simulate sphenoid sinus mucocele[3].

The treatment of sphenoid mucocele is to fenestrate the sinus wall and marsupialise the sinus mucosa[7]. Traditionally, there are several surgical approaches to the sphenoid sinus. Transseptal approaches, via either sublabial or intranasal incision, are commonly used. These approaches injure the nasal septum and the surgical access may be inadequate to provide the wide-open drainage necessary. Transnasal route with the use of operating microscope is a direct approach to the sphenoid sinus, but it frequently necessitates dissection of the ethmoid sinus and turbinates to obtain a good exposure. External or transnasal sphenoethmoidectomy requires removal of the ethmoid sinus air cells to gain access to the sphenoid sinus with increased morbidity and risks of damage to the orbit, optic nerve and intracranium. Intraoral transpalatal approach requires extensive dissection.

Endoscopic sinus surgery, pioneered more than ten years ago, has been found to be efficacious in the treatment of sphenoid mucocele[1,7]. In endoscopic sinus surgery, the surgical approach to the sphenoid sinus is direct, the endoscope provides excellent visualisation of the operative field. It obviates the extensive dissection required in most of the traditional approaches and no external incision is needed. The blood loss in this surgery is minimal. In some centres, the endoscopic sinus surgery is performed under local anaesthesia and can be performed on patients who are not fit for general anaesthesia. Endoscopic sinus surgery should be considered as the viable alternative treatment for sphenoid mucocele.

The complications of endoscopic sinus surgery can be serious or even fatal. These are due to the anaesthesia or the surgical dissection. Death from the infiltration of 1 in 100,000 concentration of adrenaline in 1% xylocaine used as local anaesthesia has been reported[8]. Other complications include cerebrospinal fluid leak and intracranial injury from inadvertent entry through the skull base, blindness due to damage to the optic nerve, diplopia from damage to medial rectus muscle, and nasolacrimal duct injury[9]. Fatal haemorrhage due to damage to an internal carotid artery aneurysm has been reported[8]. A CT scan of the sphenoid sinus is a prerequisite before the sphenoidal surgery to exclude such aneurysm. The complication rate is estimated to be between 2 and 17% and is related to the experience of the surgeon. This complication rate can be reduced by training, increased invigilance and careful surgical dissection with compulsive postoperative care[9].

CONCLUSION

Sphenoid mucocele is an uncommon disorder. This case of sphenoid mucocele presenting with cough and pharyngeal discomfort was detected with flexible intranasal endoscope in the clinic. The success of endoscopic sinus surgery in the treatment of this case is documented. The authors would recommend the routine use of the flexible or rigid intranasal endoscope in the clinical otolaryngologic examination for evaluation of nasal and pharyngeal symptoms as well as endoscopic sinus surgery as treatment of choice for this condition in view of the direct surgical access, good visualisation and low morbidity.

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