

# Surgical treatment of recurrent mucocele of the sphenoid sinus

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## INTRODUCTION

Most mucoceles of the paranasal sinuses arise in the ethmoid sinus, especially near the border with the frontal sinus. They are rare in the sphenoid sinus. Recurrent mucocele of the sphenoid sinus is even rarer and may occur after surgical treatment by the intracranial approach (Villani et al., 1979; Nugent et al., 1970). The cause of mucocele of the sphenoid sinus is unknown, although obstruction of the ostium and cystic degeneration of the mucous glands of the epithelial lining have been proposed (Touma, 1979).

The most common symptom of the disease is headache (Nugent et al., 1970); only a few cases have been reported without headaches. Ophthalmic features, e.g. visual impairment, ophthalmoplegia and exophthalmos are late manifestations which almost invariably bring the patients to hospital.

Blindness obviously needs urgent treatment, but there is no consensus as to the number of days after the onset that surgery has a chance of restoring of vision. Other symptoms and signs may result from the compression of cranial nerves I-VI by an expanding mucocele (Wurster et al., 1986).

Prior to the advent of computerized tomography the diagnosis of mucocele of the sphenoid sinus used to be based on sinus X-rays. Not infrequently this led the surgeon to a mistaken diagnosis of pituitary tumour, with subsequent craniotomy and persistence of the lesion.

There have been many different surgical approaches to the disease: intracranial, transseptal, intranasal, transethmoidal, transpalatal and external ethmoidal. The best approach in any given case needs careful evaluation.

Controversy in diagnosis and treatment of mucocele of the sphenoid sinus should lessen when accurate diagnosis is regularly attained by computerized

tomography and when surgical techniques are refined by the use of the fiberoptic endoscope. In addition, study of the possible causes of recurrences should lead to more effective treatment.

This paper describes our method of surgical treatment of a case of mucocele of the sphenoid sinus, which had been treated elsewhere both by the intracranial and intranasal approaches, and which recurred three times.

#### CASE REPORT

The patient was a 34-year-old man, who had had a maxillary sinusectomy at the age of 15. Four years before admission to our hospital he had started to suffer from episodes of frontal headache and blurred vision of the right eye. These symptoms were brought on by alcohol and lasted about 10 minutes. After two years the vision of his right eye had deteriorated to perception of light only. A diagnosis of mucocele of the sphenoid sinus was made by a neurosurgeon elsewhere, who exposed the lesion via the transeptal approach, and the vision of the right eye was regained.

A month later residual disease was found by computerized tomography and a second operation was performed via the intranasal route. In the course of this operation cerebrospinal fluid leakage was encountered from the roof of the ethmoid sinus, and the operation was changed to the intracranial approach. The mucocele was exposed and as much of the lining as possible was removed.

A third operation became necessary six months later when recurrence of the lesion caused severe headaches. An otolaryngologist elsewhere treated him at that time, when the mucocele was opened by the intranasal transethmoidal approach. A year later, however, the patient suffered yet another recurrence characterized by generalized headaches worse in the evenings, and swelling of the right upper eyelid, which brought him to us.

X-rays showed marked clouding of the sphenoid sinus on the lateral view. Computerized tomography delineated a round, isodense mass in the sphenoid sinus, the osseous walls of which showed occasional absorptions. The treatment had to be aimed not only at exposure of the mucocele but also at prevention of a fourth recurrence.

The strategies we have developed for prevention of recurrence are: submucous septal resection of the deviated septal cartilage to create a large space within the nasal cavity; the use of the opposite nasal cavity to circumvent the formation of scar tissue; complete exenteration of the ethmoid sinus to provide wide exposure of the anterior wall of the sphenoid sinus; and the use of an endoscope as an aid to meticulous surgery.

The anterior wall of the sphenoid sinus was opened under endoscopic vision and about 15 ml of yellow pus-like fluid were evacuated. The lining of the mucocele appeared to be normal sinus mucosa. The optic canal on either side protruded



prominently into the cavity of the mucocele but its bony walls had not been eroded (Figure 1).

The roof of the cavity was found to be pulsating strongly, indicating a bony deficiency in the base of the skull. The postoperative course was uneventful with the window to the sphenoid sinus remaining open one year later.

#### DISCUSSION

The case presented here was characterized by three recurrences, two after neurosurgical approaches and one after an otolaryngological procedure. Mucocele of the sphenoid sinus has been regarded as a benign lesion that can be controlled by exposure and drainage. Reports on recurrent cases are not frequent in the world literature.

Two cases of recurrence, one described by Villani et al. (1979) and the other by Nugent et al. (1970), had both followed an intracranial approach, where inadequate drainage into the nasal cavity seemed to have been the cause. Both patients underwent revision by the intranasal route.

The complications of intracranial surgery for mucoceles are not limited to recurrence, but include cerebrospinal fluid leakage, meningitis and even death. The risks are those inherent in using this route for management of nasal disease.

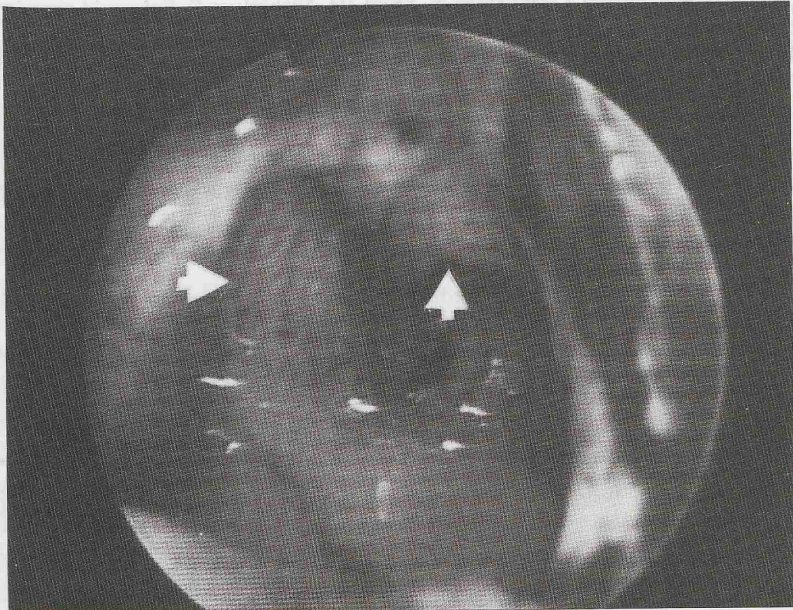


Figure 1. View inside the exposed mucocele of the sphenoid sinus. Some pus remains on the floor.  $\uparrow$  indicates the optic canal,  $\rightarrow$  the bone defect.

Creating a passage between the mucocele and the nasal cavity through the subarachnoid space makes the patient at risk of developing retrograde infection of the cranial contents.

Nugent et al. in 1970 claimed that serious complications were likely to occur only in those patients who had had craniotomies. Hakuba et al. (1975) reported on 30 such cases where postoperative infection resulted in four deaths, meningitis occurred in two cases, and cerebrospinal fluid rhinorrhoea in one. Other deaths related to the intracranial approach have also been reported by Minagi et al. (1972) and Sellars et al. (1981).

Providing permanent drainage for the mucocele is a prerequisite for the prevention of a recurrence unless complete obliteration of the mucocele lining has been achieved - any remaining remnants eventually lead to a recurrence.

Wilberger et al. (1985) reported on a case of mucocele of the pterygoid recess treated by frontal craniotomy where a CO<sub>2</sub> laser had been used to obliterate all the cyst mucosa. This procedure may have a place in the management of mucocele of the sphenoid sinus via the intracranial route where access is difficult. It is our belief that a mucocele of the sphenoid sinus is best treated surgically by the intranasal route, as it is a nasal disease which requires drainage into the nasal cavity.

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