

## Sphenoid sinus mucocoele: a possible late complication of radiotherapy to the head and neck

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### Abstract

A case of sphenoid sinus mucocoele following radiotherapy in a patient with nasopharyngeal carcinoma is reported. Diagnosis was made by radiological investigation and confirmed at surgery performed via a sublabial transeptal approach. Its content was completely removed and continuous drainage of the sinus was maintained by an indwelling tube. It is felt that the sphenoid mucocoele developed as a result of occlusion of the sinus ostium by scarred mucosa following radiotherapy.

### Introduction

Sphenoid sinus mucocoele is a relatively rare entity. Few cases have been reported sporadically in the literature. We encountered a case of sphenoid sinus mucocoele recently in a patient who had received radiotherapy six years earlier for a nasopharyngeal carcinoma. This presentation highlights an unusual but possible delayed complication of radiotherapy to the head and neck region.

### Case report

A 30-year-old Chinese man, was referred on the 10 December 1990 with history of progressive blurring of vision of six months duration. There was no history of nasal symptoms, headache or fever. He had previously suffered from nasopharyngeal carcinoma which had been treated in 1984 by radiotherapy.

Clinical examination showed a healthy young man. There was mild proptosis of the left eye. The right eye was normal.

Nasal examination was unremarkable. There was no evidence of recurrence of the tumour in the nasopharynx, confirmed by repeated nasopharyngeal biopsies. There was no palpable neck node or neurological deficit.

Visual acuity was 6/9 on the left side and 6/6 on the right. There was no field defect and the fundi were normal. Plain X-ray of the paranasal sinuses showed an expanded sphenoid sinus with erosion of the floor of the pituitary fossa (Fig. 1). These findings were confirmed on CT scan (Fig. 2). A diagnosis of sphenoid sinus mucocoele was made based on these radiological findings.

Under general anaesthesia, the sphenoid sinus was approached through a sublabial transeptal technique. The

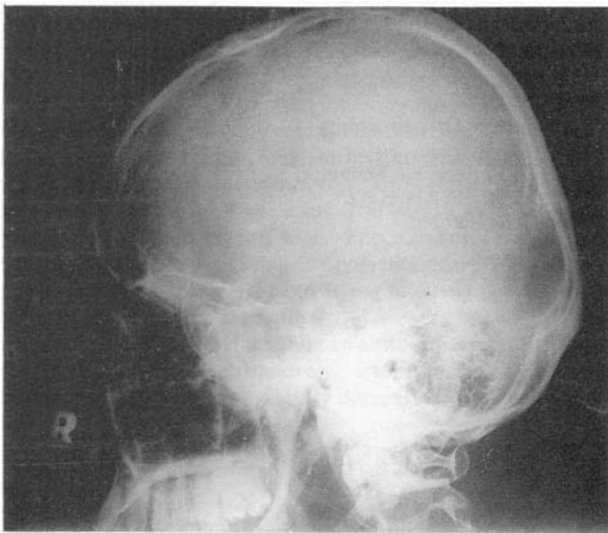


FIG. 1

Lateral view of the skull showing an expanded sphenoid sinus.

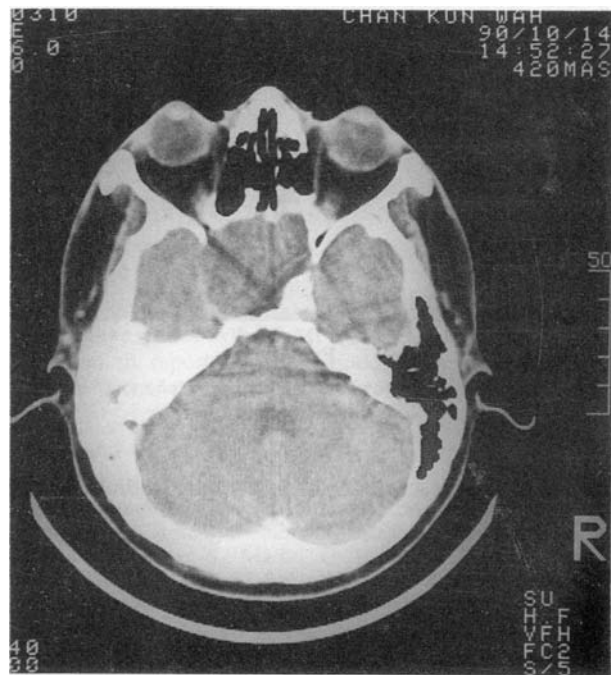


FIG. 2

Axial CT scan section showing an expanded sphenoid sinus filled with fluid.

anterior wall of the sphenoid sinus was found to be very thin and could be punctured easily. The sphenoid sinus was filled by thick viscid yellowish fluid which was completely removed. All the mucosal lining of the sinus was excised. The roof of the sphenoid sinus was found to be eroded thus exposing the dura. An indwelling tube was left *in situ* through the anterior wall providing drainage to the sinus into the nasal cavity (Fig. 3). Culture of the fluid grew *Staphylococcus aureus*.

The patient recovered very well and his vision on the left side became normal a few days after the operation. Eight weeks later the indwelling tube was removed. Repeated endoscopic examination on subsequent follow-ups showed a patent sphenoid sinus opening.

### Discussion

The aetiology of sphenoid sinus mucocoele is not exactly known. The role of radiotherapy as a primary cause of sphenoid sinus mucocoele has not been documented in a review of the English literature over the past 10 years. It is popularly believed that a mucocoele is due to occlusion of the sinus ostium by either an osteoma or oedematous mucosa (Nugent *et al.*, 1970). Another theory suggested that a mucocoele is due to cystic dilatation of the goblet cells which are present in the lining mucosa of the sinus (Chen *et al.*, 1986). Our case seems to support the former theory of ostium occlusion. We believe that the sphenoid mucocoele developed as a result of occlusion of the sinus ostium by scarred mucosa following radiotherapy. This is based on the facts that the patient had been previously irradiated and that further examination showed no evidence of recurrence of nasopharyngeal carcinoma.

Mucocoeles in general are usually lined by normal mucosa



FIG. 3

Axial CT scan section showing a well aerated sphenoid sinus with indwelling tube in situ.

**Key words:** Mucocoele; Sphenoid sinus; Radiation injury

and contain yellowish or brownish fluid. The fluid is usually sterile but occasionally *Staphylococcus aureus* may be isolated as seen in our case.

Clinically, the majority of patients with sphenoid sinus mucocoeles present with headache, nasal symptoms or visual disturbances (Stankiewicz, 1989). Visual disturbances may vary from single errors of refraction to total loss of vision, which is due to the pressure effect of the expanded sinus on the vessels and nerves passing through the optic foramen.

Diagnosis can be difficult because nasal examination is usually unremarkable. Radiological examination is probably more helpful. Plain X-rays of the skull will show an expanded sphenoid sinus. A CT scan is better in showing the expanded sinus and its relation to the adjacent structures.

The aim of treatment is to re-establish drainage of the sphenoid sinus. In this case, the sinus was opened via a sublabial transeptal approach. This method provides a mid-line approach and good visualization of the sphenoid sinus through its anterior wall. The transthemoidal technique, whilst leaving behind a facial scar, is not a mid-line approach and therefore has a higher morbidity. The endoscopic transnasal approach provides a direct and excellent visualization to the sphenoid sinus provided that the surgeon is familiar with the technique.

Continuous drainage of the sphenoid sinus is created by making an opening in the anterior wall of the sinus. An indwelling tube is left *in situ* for at least eight weeks to prevent closure of the newly created opening. The prognosis of sphenoid sinus mucocoele is good in all treated cases.

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