

## Giant Sphenoidal Mucocele Presented to the Emergency in Coma

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## 1. Case Report

A 55-year-old female patient was presented to the emergency department because of sudden unconsciousness. She had a history of hypertension for 5 years, but her blood pressure was under uncontrolled. The family described suffering from mild headaches and blurred vision for 2 years. Physical examination showed T: 38.4°C, BP: 97/81mmHg, GCS score 7 (1+1+5), left pupil 3 mm, right pupil 5 mm, light reflex disappeared. Blood tests showed that white blood cells ( $31.97 \times 10^9/L$ ) and neutrophils ( $29.21 \times 10^9/L$ ) were significantly elevated, indicating the presence of infection in vivo. Computed tomography (CT) examination revealed a large mass in the sphenoid sinus area with bone destruction (Figure A). To further elucidate the cause of the patient's coma, magnetic resonance imaging (MRI) results revealed a huge mass in the sphenoid sinus with a right subdural "hematoma" (Figure B-F). Thus, the right subdural "hematoma" was found to be the main cause of coma.

Therefore, emergency craniotomy was performed to remove the right frontotemporal subdural "hematoma", relieving the compression of brain tissue, and large bone flap removal was performed to prevent intracranial hypertension. The subdural "hematoma" was found to be abscess intraoperative (Figure G), so aggressive anti-infective treatment was administered postoperatively. However, blood tests showed that white blood cells ( $14.36 \times 10^9/L$ ) and neutrophils ( $11.21 \times 10^9/L$ ) were still higher than normal. MRI examination showed that the sphenoid sinus purulent cyst was not under control (Figure H-I), which may cause severe intracranial infection. Thus, endoscopic sphenoidal cyst incision was performed to drain the abscess (Figure J). After the operation, the patient received active rehabilitation treatment, and the patient's conscious-

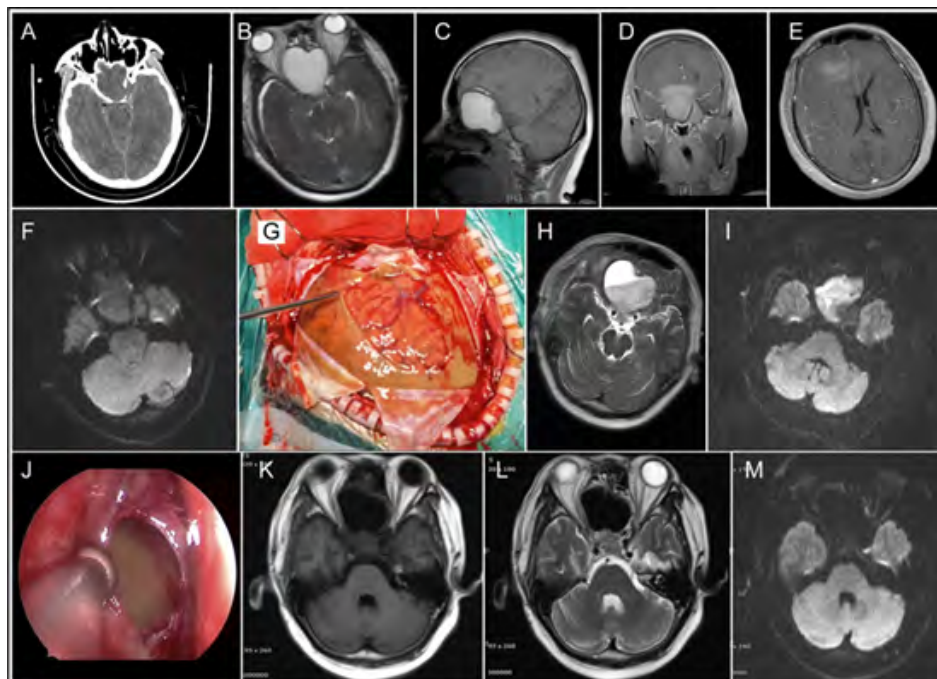
ness returned to normal, and he could partially take care of himself (Figure K-M).

In this case, coma is the main symptom of this patient, and the hypertension history would lead the doctor to consider the patient's coma caused by massive intracranial hemorrhage<sup>1</sup>. But the blood pressure was actually dropped. There was no hypertension manifestation of hypertensive intracerebral hemorrhage. The concomitant significant increase in white blood cells and fever may lead emergency physicians to consider the coma caused by septic infection shock. Taking improve circulation and anti-infective therapy as the main treatment principles, delaying the treatment of patients. Moreover, CT examination revealed sphenoid sinus mass with midline displacement and herniation, which still made it difficult to identify the primary cause of the patient's coma. Fortunately, further MRI revealed a subdural "hematoma" in the right parietal and temporal lobe, which did not show abnormal on CT because its density and brain tissue were similar. Until now, the relationship between subdural "hematoma" and sphenoidal mass still unknown. For the space-occupying diseases of the anterior skull base, the differential diagnosis of sphenoid sinus cyst, paranasal sinus tumor, osteofibrotic and dysmorphic osteitis, nasopharyngeal squamous cell carcinoma, metastasis, meningioma and other diseases is needed<sup>2</sup>. In this case, sphenoid sinus placeholder on CT show the density of soft tissue, such as difficult to determine the specific disease, further MRI images show that sphenoid sinus placeholder for low signal in T1, for high signal on T2, and DWI sequence for low signal, prompt sphenoid sinus cyst, but still can't completely rule out the possibility of an abscess, because of the sphenoid sinus cyst signal is closely related to the protein concen-

tration, which can be displayed as low signal, medium signal and high signal. Based on the unitary principle of disease diagnosis, we believe that the cyst of the sphenoid sinus ruptures into the brain, resulting in subdural "hematoma", which also explains that the subdural "hematoma" is difficult to distinguish from the brain tissue in CT examination, and the significant increase of white blood cells and temperature may be derived from the pus in the cyst.

In the past decades, the development of imaging technology has greatly contributed to the diagnosis of central nervous system diseases. However, the subdural "hematoma" was not shown on CT in this case because its density was similar to that of the brain tissue, and further MRI were needed, which increased the difficulty of treatment. Nevertheless, we can find the patient has a history of headache and blurred vision for two years by following up the

patient's medical history. Combined with the patient's imaging examination results, which will help doctors to make a faster diagnosis of this disease. Usually, headache is the first clinical symptom of sphenoid sinus cyst with an incidence of 70%-90%<sup>3</sup>. It may be caused by the expansion of sphenoid sinus cyst growth and upward extrusion of sphenoid plane dura. Visual impairment was the second most common clinical manifestation of sphenoid sinus cyst, with an incidence of 65%. The optical nerve is directly compressed by the cyst<sup>4</sup>. On the other hand, contrasted imaging examination can also help us to further differentiate the sphenoid sinus mass. Tumors usually show hyperintensity on enhanced images, whereas cysts show enhancement of the cyst wall. If the patient's condition permits, endoscopic exploration can also be performed and used as a means of therapy. Because endoscopy has become the best treatment for sphenoid sinus cyst at present.



Figures:

## 2. Acknowledgment

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## 3. Contribution

Qun Li and Jianglong Lu contributed to the conceptual formation of this report; Yuhang Guo collected the data for this report and drafted this paper and prepared the figure.

## 4. Potential Conflicts of Interest

There is no conflict of interest.

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