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Isolated fungal sinusitis of the sphenoid sinus - A case report

Sinusitis fúngica aislada del seno esfenoidal - reporte de un caso

Muhammad Fadjar Perkasa

SUMMARY

Introduction: *Isolated sphenoidal fungal sinusitis is a rare disease, representing 3% of all sinusitis cases. The disease usually occurs together with other paranasal sinus infections. Viral, bacterial, parasitic, and fungal infections can cause sinusitis. Fungal infection of the sphenoidal sinuses is rarely diagnosed, as it has no characteristic symptoms and is not much different from bacterial or other sinusitis infections. The diagnosis of fungal sphenoid sinusitis is based on history taking, physical examination, and supporting examination. The therapy aims to reduce sinus cavity inflammation, improve drainage, and overcome the pressure on the sinuses that cause painful symptoms. Endoscopic Sinus Surgery (ESS) is a surgical technique on the paranasal sinuses using an endoscope that aims to improve ventilation and mucociliary clearance of the sinuses.*
Case report: *A 67-year-old man came for treatment with symptoms of headache that was felt especially in the forehead for the last 2 years. Both limbs felt weakened 4 months ago. A non-contrast skull CT-Scan showed solid lesions with calcifications in the left sphenoid and temporal regions. The patient then performed ESS surgery with a sphenoidectomy approach.*
Conclusion: *Fungal sinusitis infection of the sphenoid is uncommon but is increasing in incidence. Patients usually complain of non-specific symptoms such as headache, facial pain, visual disturbances, and decreased consciousness. ESS with a sphenoidectomy approach is the best option for managing fungal sinusitis.*

Keywords: *Fungal sinusitis, isolated sphenoid sinusitis, endoscopic sinus surgery.*

RESUMEN

Introducción: *La sinusitis fúngica esfenoidal aislada es una enfermedad rara, que representa el 3 % de todos los casos de sinusitis. La enfermedad generalmente ocurre junto con otras infecciones de los senos paranasales. La sinusitis puede ser causada por infecciones virales, bacterianas, parasitarias y fúngicas. La infección fúngica de los senos esfenoidales rara vez se diagnostica, ya que no tiene síntomas característicos y no es muy diferente de las infecciones bacterianas u otras sinusitis. El diagnóstico de la sinusitis esfenoidal fúngica se basa en la anamnesis, la exploración física y la exploración complementaria. La terapia tiene como objetivo reducir la inflamación de la cavidad sinusal, mejorar el drenaje y superar la presión en los senos paranasales que causa los síntomas de dolor. La Cirugía Endoscópica de Senos*

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ORCID: https://orcid.org/0000-0002-8861-1476

Department of Otorhinolaryngology-Head and Neck Surgery Medical Faculty Hasanuddin University, Makassar, Indonesia.

Corresponding author: Muhammad Fadjar Perkasa
E-mail: perkasa715@gmail.com
Address: Jl. Perintis Kemerdekaan Km. 10, Makassar 90245, South Sulawesi, Indonesia

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paranasales (CES) es una técnica quirúrgica sobre los senos paranasales mediante endoscopio que tiene como objetivo mejorar la ventilación y el aclaramiento mucociliar de los senos paranasales.
Presentación de caso: *Un hombre de 67 años acudió a tratamiento con síntomas de dolor de cabeza que se sentía especialmente en la frente durante los últimos 2 años. Ambas extremidades se sentían debilitadas desde hace 4 meses. Una tomografía computarizada de cráneo, sin contraste, mostró lesiones sólidas con calcificaciones en el esfenoides izquierdo y las regiones temporales. Posteriormente, se le realizó al paciente una cirugía de CES con un abordaje de esfenoidectomía.*
Conclusión: *La sinusitis fúngica esfenoidal aislada es una condición poco común pero que actualmente está teniendo una incidencia incrementada. Los pacientes suelen quejarse de síntomas inespecíficos como dolor de cabeza, dolor facial, alteraciones visuales y disminución de la conciencia. La CES con abordaje de esfenoidectomía es la mejor opción para el manejo de la sinusitis fúngica en este momento.*

Palabras clave: *Sinusitis fúngica, sinusitis esfenoidal aislada, cirugía endoscópica de senos paranasales.*

INTRODUCTION

The sphenoid sinus is contained within the sphenoid bone. It separates the pituitary gland from the nasal cavity. The sphenoid sinus is located posteriorly at the apex of the nasal cavity. The walls of this sinus are attached to the optic canal, dura mater, pituitary gland, and cavernous sinus, which consists of the internal carotid artery and the third, fourth, and sixth cranial nerves (1,2). This sinus comprises pseudo-ciliated epithelium with fewer mucus-secreting cells than the other paranasal sinuses. This leads to less drainage, resulting in isolated sphenoiditis (1). The most common etiology of the disease is caused by *Staphylococcus aureus* and *Streptococcus*. Gram-negative bacteria and anaerobic organisms are sometimes found in culture. Noninvasive fungal sinusitis is usually found in one sinus and the most frequently caused by *Aspergillus* (1,3).

Sphenoid sinus infection by fungi is rarely diagnosed, as it has no characteristic symptoms and resembles the symptoms of sinusitis by other microbes. According to sphenoid sinus anatomy and depending on its contiguous structures, it is frequently difficult to diagnose, as patients present with various nonspecific symptoms and complications such as headache, visual disturbance, facial and retro-orbital pain, cranial nerve palsies and decreased consciousness (3-5). Endoscopic examination of the nose sometimes reveals purulent secretions in the sphenoethmoidal sinus and thinning of the anterior sphenoidal wall (4).

Radiologic examination plays an important role in diagnosing isolated fungal sphenoidal sinusitis. For more accurate results, culture tests are needed to determine the cause of infection in the sinuses (6).

Surgical intervention is the main option in managing cases of fungal sinusitis. Sphenoidectomy with nasal endoscopy is recognized as the gold standard surgical management of isolated sphenoidal sinusitis. Compared to the external approach, endoscopic surgery provides better visualization and thus allows faster healing, and better aesthetic results (1,7).

CASE REPORT

A 67-year-old Asian male presented with a main complaint of headache, especially in the forehead, which had been experienced in the last 2 years ago (Figure 1). The headache was previously mild and improved with analgesics. The headache has become more severe and difficult to handle in the last three months. Headache accompanied by nausea and dizziness. The patient has a history of active pulmonary tuberculosis and has been undergoing treatment for 2 months.

Figure 1. The clinical picture of the patient.

The results of the anterior rhinoscopy examination showed no secretions in the left and right rice cavities, both inferior conchas were within normal limits, and no masses were seen. Nasoendoscopy showed purulent secretion coming from the sphenoid sinus. Non-contrast head CT scan showed hyperdense lesions with calcification in the left sphenoidal and temporal sinus regions (Figure 2). Laboratory results were within normal limits. ESS was planned after the patient completed tuberculosis treatment.

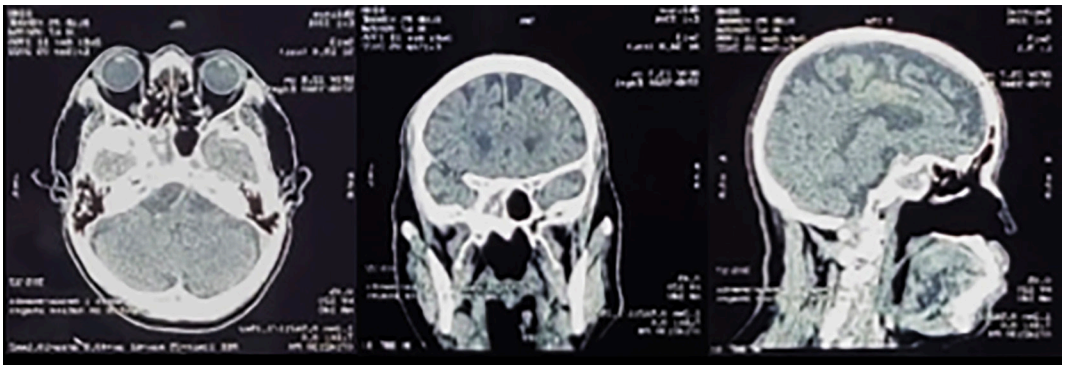

Figure 2. Non-contrast CT scan of the head. A solid lesion with calcification within the sphenoid and temporal sinus region of sinistra.

The surgical procedure was to perform ESS using a sphenoidectomy approach. The left superior conchal conchotomy was performed before performing the sphenoidectomy. A brown-black mass was seen in the sphenoid sinus. The sphenoid sinus was cleared of pathologic tissue and taken for histologic examination (Figure 3).

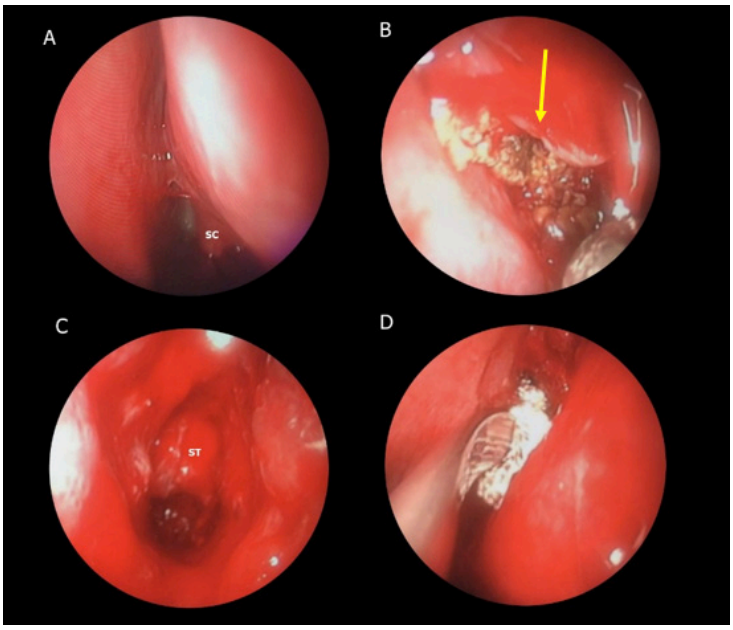

Figure 3. (A) Cut the left superior concha (SC), exposing the ostium naturalis of the sphenoid sinus. (B) Perform sphenoidectomy and a brown-black mass is seen in the sphenoid sinus and sinus mucosa (yellow arrow). (C) The Sella turcica floor (ST) appears intact. (D) Close the surgical wound using an absorbable hemostat (surgical).

In the postoperative care, no significant complaints were reported, the patient was conscious, and there was no active bleeding from the nose. The patient received broad-spectrum antibiotics and analgesics. The patient was discharged 2 days after surgery.

The patient was controlled in the outpatient department, complaining of slight pain at the surgical site. Endoscopy results showed no secretions and visualized sphenoid sinus ostium. The results of the anatomical pathology examination showed a picture of fungal spores and hyphae. Patients are given nasal irrigation therapy with sodium chloride.

DISCUSSION

Isolated sphenoid sinusitis is an inflammation of the sphenoid sinus caused by infection. Fungus is a microorganism that can cause infection in the paranasal sinuses (8). Fungal infections in the paranasal sinuses are usually caused by the irrational use of drugs, such as long-term use of antibiotics and steroids, impaired sinus ventilation, and a humid environment (6,9). The type of fungus that most commonly causes fungal sinusitis is *Aspergillus* (10).

The sphenoidal sinus is known to be the second most common sinus involved in fungal balls (11). Generally, patients have normal immunologic status. High-risk groups include patients with blood dyscrasias, diabetes, systemic steroids, or other conditions associated with immunodeficiency (12). These patients have a history of tuberculosis, leading to a state of immunosuppression.

The classification of fungal sinusitis is divided into invasive and non-invasive. Fungus balls and allergic fungal sinusitis belong to non-invasive fungal sinusitis (11,12). Invasive sinusitis includes chronic invasive fungal sinusitis and fulminant invasive disease in immunosuppressed patients. Chronic invasive fungal sinusitis is divided into granulomatous and non-granulomatous (13). This case report found a patient with non-invasive fungal sphenoid sinusitis.

The most common symptom suffered by patients with fungal sphenoid sinusitis is headache (4). This is because the sinus is innervated through the fifth cranial nerve and afferent fibers through the sphenopalatine ganglion (4,14). Another symptom that patients usually complain about is a visual disturbance or diplopia caused by optic nerve function disorders (15).

Table 1. Fungal sinusitis clas

Invasive
Acute Invasive Fungal Sinusitis
Chronic Invasive Fungal Sinusitis
Chronic Granulomatous Invasive Fungal Sinusitis
Non-invasive
Allergic fungal sinusitis
Fungus ball (fungus mycetoma)

Radiologic examination plays an essential role in diagnosing this disease. CT scan of the paranasal sinuses shows abnormalities in the paranasal sinuses, orbit, and intracranial areas (6). In addition, CT scans can show different pathological abnormalities and help rule out inflammatory diseases, neoplasms, and bacterial and fungal infections. Magnetic Resonance Imaging (MRI) is used if there is suspicion of central nervous system or eye complications (16). Culture test results can provide information on the type of germ-causing sphenoidal sinusitis (17).

Only a few cases of chronic sphenoidal rhinosinusitis reported in the literature are responsive to medicamentous therapy, and the rest require surgical intervention (1). Sphenoidal sinus surgery is indicated when bacterial sinusitis does not respond to appropriate medical therapy for 6-8 weeks and when the diagnosis of rhinosinusitis or fungal mucocele has been established (1,18). Cases with cranial nerve involvement may require more immediate surgical treatment to restore or optimize all nerve functions in time (19).

Sphenoidal sinus surgery consists of an ESS approach and external sphenoidectomy. Compared to the external approach, endoscopic surgery provides better visualization and thus allows for faster healing, better aesthetic results, lower morbidity, and higher success rates (1,7).

The concept of the ESS technique is based on reversible changes in mucociliary function and mucosal pathology by correcting the disease pathology of chronic sinusitis in the sphenoid sinus region and restoring the physiology of ventilation and drainage of the paranasal sinuses in the sphenoidal region because although abnormalities in the sphenoidal sinus area are minimal, they can interfere with sinus ventilation and mucociliary clearance (7).

Several techniques can open the sphenoid sinus. Unlike tumor surgery, resection of the middle

meatus's inferior part is usually unnecessary (1). The sphenoid ostium is then widely opened and enlarged so that any infectious or inflammatory reaction within the sphenoid sinus cavity can be completely eliminated (18).

CONCLUSIONS

Sphenoid sinus infection by fungi is rarely diagnosed, as it does not have typical symptoms that distinguish it from sinus infection by bacteria or others. Headache and blurred vision are the most common symptoms. The diagnosis can usually be made through a radiologic examination. Endoscopic sinus surgery with a sphenoidectomy approach is the primary option in these cases, with low morbidity compared to other surgical techniques.

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