ISSN 2307-8960 (online)

# World Journal of *Clinical Cases*

*World J Clin Cases* 2021 July 26; 9(21): 5754-6177

Published by Baishideng Publishing Group Inc

World Journal of Clinical Cases

Contents

Thrice Monthly Volume 9 Number 21 July 26, 2021

## REVIEW



## MINIREVIEWS



## ORIGINAL ARTICLE

### Case Control Study



### Retrospective Cohort Study



### Retrospective Study

*World Journal of Clinical Cases*

**Thrice Monthly Volume 9 Number 21 July 26, 2021**

## Contents

*World Journal of Clinical Cases*

**Thrice Monthly Volume 9 Number 21 July 26, 2021**

## Contents

*World Journal of Clinical Cases*

**Thrice Monthly Volume 9 Number 21 July 26, 2021**

## Contents

## ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Jae Gil Lee, MD, PhD, Professor, Surgeon, Department of Surgery, Yonsei University College of Medicine, Seoul 03722, South Korea. jakii@yuhs.ac

## AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (*WJCC*, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

*WJCC* mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

## INDEXING/ABSTRACTING

The *WJCC* is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for *WJCC* as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The *WJCC*'s CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

## RESPONSIBLE EDITORS FOR THIS ISSUE



**NAME OF JOURNAL**
*World Journal of Clinical Cases*

**ISSN**
ISSN 2307-8960 (online)

**LAUNCH DATE**
April 16, 2013

**FREQUENCY**
Thrice Monthly



**PUBLICATION DATE**
July 26, 2021

World Journal of Clinical Cases

Submit a Manuscript: https://www.f6publishing.com

*World J Clin Cases* 2021 July 26; 9(21): 6005-6008

DOI: 10.12998/wjcc.v9.i21.6005

ISSN 2307-8960 (online)

CASE REPORT

# Isolated fungus ball in a single cell of the left ethmoid roof: A case report

Liu-Qing Zhou, Ming Li, Yong-Qin Li, Yan-Jun Wang

**ORCID number:** Liu-Qing Zhou 0000-0003-2066-4560; Ming Li 0000-0002-2077-5461; Yong-Qin Li 0000-0002-2077-5462; Yan-Jun Wang 0000-0002-2077-5467.

**Author contributions:** Wang YJ and Zhou LQ designed the research study; Zhou LQ, Li YQ, and Li M analyzed the data and wrote the manuscript; all authors have read and approved the final manuscript.

**Informed consent statement:** All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

**Conflict-of-interest statement:** The authors have no conflicts of interest to report.

**CARE Checklist (2016) statement:** The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).



**Liu-Qing Zhou, Ming Li, Yong-Qin Li, Yan-Jun Wang,** Department of Otorhinolaryngology, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430000, Hubei Province, China

**Corresponding author:** Yan-Jun Wang, MD, Adjunct Professor, Department of Otorhinolaryngology, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, No. 1277 Jiefang Avenue, Wuhan 430000, Hubei Province, China.
yjwang@hust.edu.cn

## Abstract

*BACKGROUND*

Isolated fungus ball (FB) in a single cell of the left ethmoid roof is a very rare condition.

*CASE SUMMARY*

We report the case of a 51-year-old female patient whose computed tomography presented a soft tissue mass filling in the left ethmoid roof cell. The patient did not complain of any specific sinonasal symptoms, such as nasal discharge, nasal obstruction, and loss of smell, apart from headache in the left retro-orbital region.

*CONCLUSION*

The patient underwent functional endoscopic sinus surgery under general anesthesia, and the inflammatory material collected was histologically diagnosed as a rare case of a FB in a single cell of the left ethmoid roof.

**Key Words:** Fungus ball; Ethmoid roof cell; Headache; Computed tomography; Case report



**Core Tip:** In this case, preoperative computed tomography did not lead to the correct diagnosis, which showed a round soft tissue mass in the left ethmoid sinus without any calcification. Functional endoscopic sinus surgery in the patient revealed cheesy, clay-like material that was highly suggestive of a fungus ball (FB). The histological investigation confirmed the accurate diagnosis; however, negative results were obtained from FB cultures.

**Manuscript source:** Unsolicited manuscript

**Specialty type:** Infectious diseases

**Country/Territory of origin:** China

**Peer-review report's scientific quality classification**
Grade A (Excellent): A
Grade B (Very good): B, B
Grade C (Good): 0
Grade D (Fair): 0
Grade E (Poor): 0

**Received:** January 26, 2021
**Peer-review started:** January 26, 2021
**First decision:** April 29, 2021
**Revised:** May 7, 2021
**Accepted:** June 3, 2021
**Article in press:** June 3, 2021
**Published online:** July 26, 2021

**P-Reviewer:** Abdullah B, Lobo D, Unal M
**S-Editor:** Zhang H
**L-Editor:** Wang TQ
**P-Editor:** Ma YJ

**Citation:** Zhou LQ, Li M, Li YQ, Wang YJ. Isolated fungus ball in a single cell of the left ethmoid roof: A case report. *World J Clin Cases* 2021; 9(21): 6005-6008
**URL:** https://www.wjgnet.com/2307-8960/full/v9/i21/6005.htm
**DOI:** https://dx.doi.org/10.12998/wjcc.v9.i21.6005

## INTRODUCTION

Although rare, diagnoses of fungal infections of the paranasal sinuses have been increasing in the past two decades. This is mainly due to refinements in radiologic evaluation, fungal culture techniques, and surgical technology. Fungal infections can be roughly divided into two types: Invasive and noninvasive fungal rhinosinusitis[1]. The invasive form is distinguished from the noninvasive variety depending on the presence of microscopic evidence of tissue invasion through the epithelium. Fungus ball (FB) and eosinophilic localizations (allergic fungal sinusitis and eosinophilic fungal sinusitis) are forms of chronic, noninvasive fungal infection[1,2].

Immunocompetent patients are most susceptible to FB of the paranasal sinuses especially middle-aged females[3]. The mechanism of FB infection is largely unknown, although there are several hypotheses, including environmental factors, changes in air flow resistance in the nasal cavity, and anatomic structural variations in the nasal cavity. FB usually only appears in one sinus, most commonly in the maxillary sinus (94%), with the majority of the remaining cases occurring in the sphenoid. Single-cell ethmoid sinus involvement is very rare in paranasal sinus FB cases[4]. The most commonly encountered fungus is *Aspergillus* species, though other pathogens such as *Mucor*, *Alternaria*, and *Bipolaris* have also been detected[5].

The ethmoid cells are divided into anterior ethmoid cells and posterior ethmoid cells. Anterior ethmoid cells empty into the middle meatus while posterior ethmoid cells empty into the superior meatus. The ethmoid roof cell is one of the posterior ethmoid cells which empty into the superior meatus, and it is clinically significant as its superior boundary is the skull base (ethmoid roof). Hence, we name the cell as ethmoid roof cell, which is one of the posterior ethmoid cells that is connected to the ethmoid roof.

## CASE PRESENTATION

### *Chief complaints*

A 51-year-old woman with headache in the left retro-orbital region as first symptom was referred to the Department of Otolaryngology of Wuhan Union Hospital. Her headache had worsened progressively over 1 year.

### *History of present illness*

The patient had taken medication that was prescribed at a local clinic for 3 mo, but her condition did not relieve.

### *History of past illness*

The patient did not complain of any specific sinonasal symptoms, such as nasal discharge, nasal obstruction, and loss of smell apart from headache.

### *Personal and family history*

The patient denied any history of underlying systemic disease, dental surgery, facial trauma, or previous sinus surgery.

### *Laboratory examinations*

The patient underwent brain computed tomography (CT), which showed no significant alterations in brain tissue; instead, a round soft tissue mass in the left ethmoid roof cell was observed (Figure 1).

### *Imaging examinations*

The patient underwent brain CT, which showed a round soft tissue mass in the left ethmoid roof cell with no significant alterations in brain tissue (Figure 1).

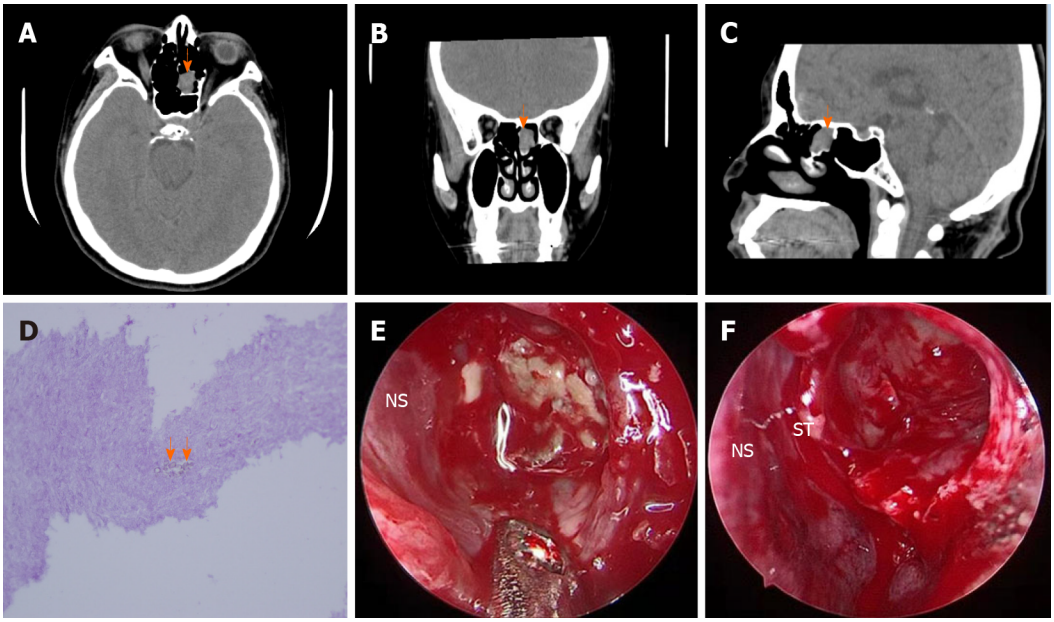


**Figure 1 Computed tomography, histopathology, and nasal endoscopic images of the case.** A-C: Computed tomography (CT) scan of the nose and paranasal sinuses showed a soft-tissue density with a round surface (arrow) in the left ethmoid roof cell (axial, coronal, and sagittal CT scans); D: Histopathological image reveals fungal hyphae (arrow) (hematoxylin and eosin staining 400 ×); E: A small, dark-brownish mass wass observed in the left ethmoid sinus using a "0" nasal endoscope; F: After functional endoscopic sinus surgery, the mass was removed. NS: Nasal septum; ST: Superior turbinate.

## FINAL DIAGNOSIS

The accurate diagnosis of left ethmoid sinus FB was confirmed by histopathological examination.

## TREATMENT

The patient underwent functional endoscopic sinus surgery (FESS). After opening the left ethmoid roof cell, a cheesy, clay-like material which was highly suggestive of an FB was observed.

## OUTCOME AND FOLLOW-UP

The patient's headache was relieved gradually after surgery.

## DISCUSSION

The diagnosis of FB is usually delayed due to the nonspecific and asymptomatic presentation of FB[6]. Therefore, it is often encountered as a part of the investigation of and treatment for chronic sinusitis. Nonspecific chronic inflammatory changes without tissue invasion by the fungi may be observed by endoscopic examination of the nasal cavity examination[7].

CT and magnetic resonance imaging (MRI) examinations are both reliable tools for the diagnosis and preoperative and postoperative evaluations of sinonasal FB. On CT scan, typical FB is usually limited to a single sinus which appears as a hyperdense mass with linear or punctuate central calcifications. On MRI, the FB demonstrates an intermediate to hypointense signal on T1-weighted images, while T2-weighted images show an isointense or hypointense signal, or even no signal, while areas of T2 low signal may be caused by calcification and paramagnetic substances[7,8]. The cost of MRI is much higher than that of CT scans; hence, CT scanning is the most preferred choice, and MRI can be used to augment CT scans. FESS can be considered the most useful treatment for FB, and the recurrence rate is very low. It is important to completely eliminate the FB and reestablish ventilation together with draining of the

sinus to its natural ostium during surgery. Histopathology plays a key role in the identification of tissue invaded by the fungi.

## CONCLUSION

In this case, preoperative CT scan showed a round soft tissue mass in the left ethmoid sinus without any calcification, which did not lead to the correct diagnosis. The patients revealed cheesy, clay-like material that was highly suggestive of an FB in the FESS. The histological investigation confirmed the accurate diagnosis as FB; however, negative results were obtained from FB cultures. It is reported that only 23%-50% of FB cultures are positive according to the literature.

## REFERENCES


1 **deShazo RD**, Chapin K, Swain RE. Fungal sinusitis. *N Engl J Med* 1997; **337**: 254-259 [PMID: 9227932 DOI: 10.1056/NEJM199707243370407]

2 **Hora JF**. Primary aspergillosis of the paranasal sinuses and associated areas. *Laryngoscope* 1965; **75**: 768-773 [PMID: 14312647 DOI: 10.1288/00005537-196505000-00004]

3 **Lop-Gros J**, Gras-Cabrerizo JR, Bothe-González C, Montserrat-Gili JR, Sumarroca-Trouboul A, Massegur-Solench H. Fungus ball of the paranasal sinuses: Analysis of our serie of patients. *Acta Otorrinolaringol Esp* 2016; **67**: 220-225 [PMID: 26708329 DOI: 10.1016/j.otorri.2015.09.005]

4 **Dufour X**, Kauffmann-Lacroix C, Ferrie JC, Goujon JM, Rodier MH, Karkas A, Klossek JM. Paranasal sinus fungus ball and surgery: a review of 175 cases. *Rhinology* 2005; **43**: 34-39 [PMID: 15844500]

5 **Ferguson BJ**. Fungus balls of the paranasal sinuses. *Otolaryngol Clin North Am* 2000; **33**: 389-398 [PMID: 10736412 DOI: 10.1016/s0030-6665(00)80013-4]

6 **Grosjean P**, Weber R. Fungus balls of the paranasal sinuses: a review. *Eur Arch Otorhinolaryngol* 2007; **264**: 461-470 [PMID: 17361410 DOI: 10.1007/s00405-007-0281-5]

7 **Zinreich SJ**, Kennedy DW, Malat J, Curtin HD, Epstein JI, Huff LC, Kumar AJ, Johns ME, Rosenbaum AE. Fungal sinusitis: diagnosis with CT and MR imaging. *Radiology* 1988; **169**: 439-444 [PMID: 3174990 DOI: 10.1148/radiology.169.2.3174990]

8 **Seo YJ**, Kim J, Kim K, Lee JG, Kim CH, Yoon JH. Radiologic characteristics of sinonasal fungus ball: an analysis of 119 cases. *Acta Radiol* 2011; **52**: 790-795 [PMID: 21525111 DOI: 10.1258/ar.2011.110021]

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
**Telephone:** +1-925-3991568
**E-mail:** bpgoffice@wjgnet.com
**Help Desk:** https://www.f6publishing.com/helpdesk
https://www.wjgnet.com