



Incidental discovery of a fungal ball during esthetic malar reduction surgery: a case report

Atapol Yongvikul^{1,2}, Walop Supavanich³, Jae-Young Kim⁴, Jong-Ki Huh⁴

¹Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Bangkokthonburi University,

²Maxillofacial Center and ³Facelift Center, Masterpiece Hospital, Bangkok, Thailand,

⁴Department of Oral and Maxillofacial Surgery, Gangnam Severance Hospital, Yonsei University College of Dentistry, Seoul, Korea

Abstract (J Korean Assoc Oral Maxillofac Surg 2025;51:309-313)

Fungal ball is a non-invasive accumulation of the fungal element within the paranasal sinuses, most commonly affecting the maxillary sinus. This lesion often remains asymptomatic and is typically identified incidentally during imaging. This case report described the unexpected discovery of a maxillary fungal ball during elective esthetic facial contouring surgery in a healthy, asymptomatic 37-year-old female. Preoperative cone-beam computed tomography imaging revealed a chronic sinusitis-like lesion, which intraoperatively was confirmed as a dark-brown, fluffy mass in the right maxillary sinus. Histopathological analysis identified septate fungal hyphae consistent with non-invasive aspergillosis. Postoperative follow-up demonstrated no recurrence or sinus-related symptoms. This case showed the importance of thorough preoperative imaging and intraoperative vigilance in esthetic surgeries involving facial bones adjacent to sinus structures. Recognizing the potential for undiagnosed sinus pathology, even in asymptomatic patients, is essential for minimizing surgical complications and optimizing patient outcomes.

Key words: Aspergillosis, Fungal infection, Zygoma, Maxillary sinus

[paper submitted 2025. 6. 27 / revised 2025. 8. 27 / accepted 2025. 9. 17]

I. Introduction

Fungal balls, also known as mycetomas, are non-invasive accumulations of fungal elements within a sinus cavity¹. Unlike invasive fungal infections, fungal balls do not penetrate mucosal tissues but instead form dense aggregates of fungal hyphae¹⁻³. These lesions are frequently encountered as an incidental finding on imaging studies or in patients presenting with chronic sinusitis-like symptoms such as nasal obstruction, postnasal discharge, and paranasal pain^{2,3}. This lesion can be found in any paranasal sinuses, while the maxillary sinus is the most commonly affected sinus^{1,3,4}. Their presence can mimic other sinus pathologies, making them a diagnostic

challenge.

This case report showed a rare instance of fungal ball discovery during an esthetic procedure, underscoring the need for meticulous preoperative evaluation and intraoperative vigilance. In cases where elective facial surgeries intersect with sinus anatomy, unsuspected fungal balls can complicate surgical outcomes and recovery^{5,6}. By documenting this occurrence, the report aims to raise awareness among clinicians regarding the potential for undiagnosed sinus pathology, reinforcing the importance of thorough radiological assessment and intraoperative adaptability to ensure optimal patient care.

II. Case Report

This report showed the case of a healthy 37-year-old Thai female who sought esthetic facial contouring surgery at the Department of Maxillofacial Surgery, Masterpiece Hospital. She was immunocompetent and denied any sinus-related symptoms, including cold-like manifestations, paranasal pain, nasal congestion, or dental discomfort. Her facial morphology exhibited masculine features, including prominent malar bones, increased malar width, and wide gonial width,

Jong-Ki Huh

Department of Oral and Maxillofacial Surgery, Gangnam Severance Hospital, Yonsei University College of Dentistry, 211 Eonju-ro, Gangnam-gu, Seoul 06273, Korea

TEL: +82-2-2019-4560

E-mail: omshuh@yuhs.ac

ORCID: <https://orcid.org/0000-0002-7381-3972>

© This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

© 2025 The Korean Association of Oral and Maxillofacial Surgeons.

with a normal mandibular angle. While she had no prior facial contouring surgery, she had received resorbable facial fillers for contouring the temple area and filling cheek grooves. She aimed to undergo esthetic zygoma reduction and mandibular buccal cortex osteotomy.(Fig. 1) Although Institutional Review Board (IRB) review was not required (BTU-IRB-38/2568), this case report was prepared in accordance with Health Insurance Portability and Accountability Act (HIPAA) regulations. Prior to the operation, she received radiographic examination. Cone-beam computed tomography (CBCT) revealed significant mucosal thickening within the right sinus cavity, predominantly along the sinus walls. Despite the presence of thickened mucosa, no air-fluid levels were detected. The surrounding bony structures remained

intact without signs of osteitis or erosion.(Fig. 2) During the zygomatic osteotomy, there was a soft dark-brown fluffy ball-like structure at the supero-antero-lateral part of the right maxillary sinus.(Fig. 3) The tissue measuring 0.6×0.5×0.3 cm. After the content was removed, the entire maxillary sinus was explored and the result was negative. The maxillary sinus was copious irrigation with normal saline solution, then the zygomatic bone was fixed with L-shape miniplate and screws 2.0 mm for esthetically repositioning. Histopathological examination revealed clusters of acute-angled, branching, septated hyphae with focal dystrophic calcification, morphologically consistent with *Aspergillus* spp. No atypia, granuloma, or malignancy was observed.(Fig. 4) Consequently, the definitive diagnosis was non-invasive aspergillosis. Antibiotics prophylaxis and non-steroid anti-inflammatory drugs were prescribed. However, the anti-fungal drug was not prescribed according to the treatment protocol of the non-invasive fungal ball. At the three-month follow-up with an otolaryngologist, the patient remained asymptomatic with no sinus-related complaints. Radiographic evaluation revealed no abnormal findings. The radiographic images and clinical photograph were showed in the Fig. 1, 2.

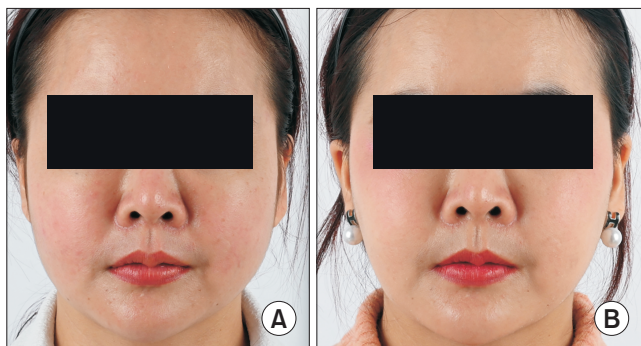


Fig. 1. Preoperative and postoperative clinical photographs. A. Preoperative photograph. B. Three-month postoperative photograph.

Atapol Yongvikul et al: Incidental discovery of a fungal ball during esthetic malar reduction surgery: a case report. J Korean Assoc Oral Maxillofac Surg 2025

III. Discussion

Paranasal sinus fungus balls, a form of non-invasive fungal sinusitis, are localized aggregates of fungal hyphae within the sinus cavity, mostly affecting the maxillary sinus, with less common extra-maxillary or multiple presentations^{2,4}. The

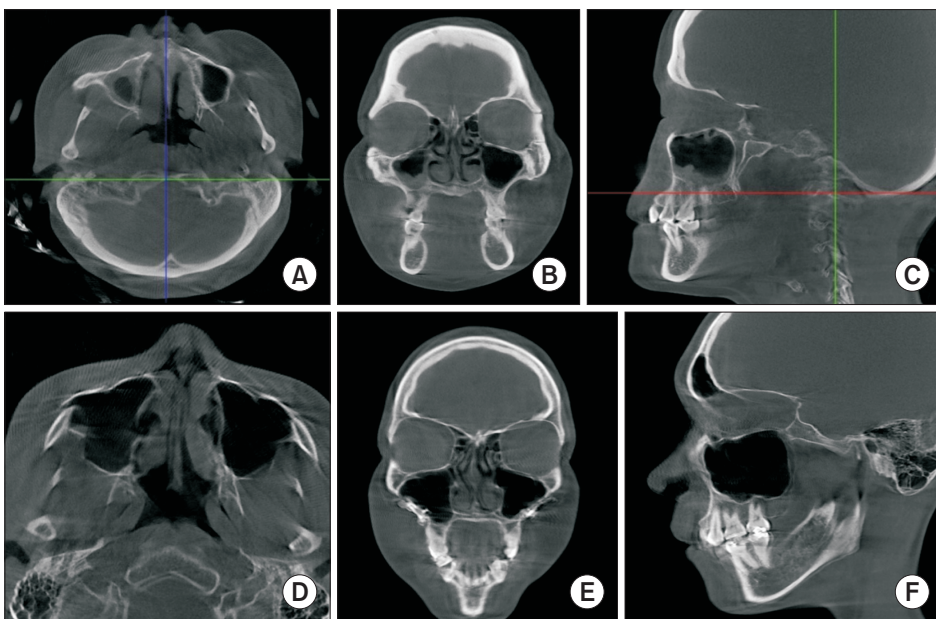


Fig. 2. Preoperative and postoperative cone-beam computed tomography in axial (A), coronal (B) and sagittal (C) views revealed significant mucosal thickening within the right sinus cavity, predominantly along the sinus walls. Despite the presence of thickened mucosa, no air-fluid levels were detected. The surrounding bony structures remain intact without signs of erosion. At the three-month postoperative follow-up (D-F), no signs of infection were observed. Atapol Yongvikul et al: Incidental discovery of a fungal ball during esthetic malar reduction surgery: a case report. J Korean Assoc Oral Maxillofac Surg 2025



Fig. 3. A soft, dark-brown, fluffy, ball-like structure was observed at the supero-anterolateral aspect of the right maxillary sinus following zygomatic bone osteotomy.

Atapol Yongvikul et al: Incidental discovery of a fungal ball during esthetic malar reduction surgery: a case report. *J Korean Assoc Oral Maxillofac Surg* 2025

incidence has risen over the past decades, with up to 8.3% of affected patients requiring endoscopic sinus surgery⁷. The most common caused by *Aspergillus spp.* Unlike invasive fungal infections, they do not breach mucosal barriers or elicit significant systemic responses^{3,8}. Risk factors include prior sinus surgery, impaired muco-ciliary clearance, chronic sinus inflammation, and environmental frequently exposure to fungal spores. Compared with post-operative maxillary sinusitis, maxillary sinus fungal ball presents with a chronic course without nasal discharge. While post-operative sinusitis commonly manifests with facial pain, with or without purulent nasal discharge, fever, and responds well to antibiotic therapy. Importantly, patients with fungal balls often do not improve with antibiotics, leading to delayed diagnosis⁹. A literature from Kimura et al.⁵ reported a case with fungal ball related to dental root canal filling material invaded into maxillary sinus. While, Kim et al.¹⁰ reported a case with fungal abscess after esthetic malar bone reduction. From the report, the undiagnosed fungal ball led to a postoperative peri-antral abscess. It was emphasizing the need for vigilance in identifying asymptomatic sinus pathologies before facial bone surgery. From the data we had, this was the first report of malarplasty performed in a patient with a fungal ball, a condition that is much less common than sinusitis.

Radiologic findings are keys to diagnosing fungal ball. On CT, they often appear as hyperdense masses within the affected sinus, lacking fluid levels or mucosal invasion. The presence of calcified densities differentiates fungal balls from other sinonasal pathologies⁸. Magnetic resonance imaging may further aid in evaluation, demonstrating variable signal intensity due to fungal elements and calcification^{3,8}. While

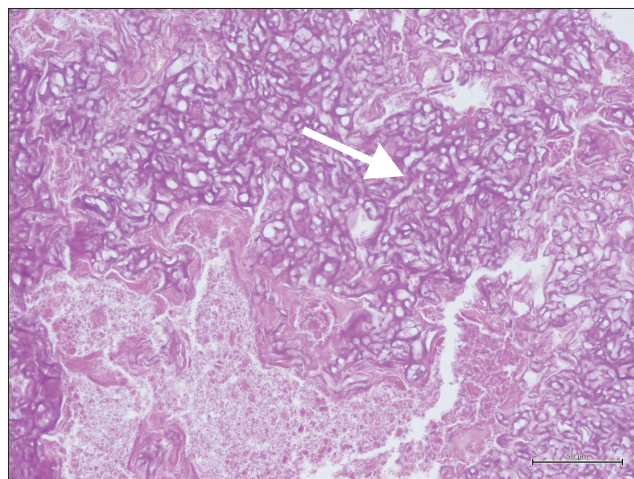


Fig. 4. Histopathological examination using hematoxylin and eosin (H&E) stain revealed clusters of acute-angled, branching, septated hyphae (indicated by white arrow), morphologically consistent with *Aspergillus spp.*, observed under $\times 10$ magnification.

Atapol Yongvikul et al: Incidental discovery of a fungal ball during esthetic malar reduction surgery: a case report. *J Korean Assoc Oral Maxillofac Surg* 2025

this case report established a definitive diagnosis of asymptomatic non-invasive aspergillosis, the CBCT cuts reveal notable mucosal thickening within the affected sinus cavity, suggestive of inflammation. The thickening appears along the sinus walls, indicating sinusitis. While air-fluid levels, which would typically suggest of the bacterial infection, were not evidenced. The presence of soft tissue density could reflect retained secretions or mucosal edema. The surrounding bony structures remained intact without signs of osteitis or erosion, ruling out of more severe chronic sinus disease. This radiographic appearance aligns with sinusitis, possibly due to viral, allergic, or mild infectious causes including non-invasive fungal infection. Although rare, fungal balls may be discovered incidentally during esthetic surgeries involving the maxillary sinus, such as malarplasty. This case report emphasized the importance of thorough preoperative assessment, underscoring that pathologies of the maxillary sinus can manifest unexpectedly, even outside conventional diagnostic pathways. Notably, the absence of calcified densities in CBCT eliminated a key radiographic clue that might have suggested the presence of a fungal ball.

According to a clinical consensus statement⁸, the management of paranasal fungal ball should be tailored to individual patient characteristics rather than universally mandated. In certain clinical scenarios, treatment is imperative, particularly before maxillary sinus augmentation, where an untreated fungal ball may compromise bone grafting and implant success^{8,11}. For patients undergoing planned iatrogenic im-

munosuppression or those who were immunocompromised, intervention was highly recommended, especially in cases where secondary rhinosinusitis developed. The main reason for intervention was that immunocompromised patient had been reported to be at risk of fungal balls progressing into invasive fungal sinusitis. Symptomatic immunocompetent individuals also benefit from surgical removal, as persistent symptoms could indicate disease progression⁸. Similarly, addressing aspergillosis before upper jaw dental implant placement optimizes surgical outcomes^{6,8,12}. However, for asymptomatic, immunocompetent patients with no secondary rhinosinusitis, a watchful waiting approach with clinical and radiologic monitoring is a reasonable alternative, particularly when significant comorbidities or anesthetic risks are present^{3,8}. In contrast to previous studies^{6,8,12} where asymptomatic patients did not require surgical intervention, our patient underwent incidental surgical removal of a fungal ball during an aesthetic malar reduction procedure, which exposed the maxillary sinus cavity. Our approach may have functioned similarly to the Caldwell-Luc procedure, providing an open surgical effect for treating fungal sinus infections^{13,14}. The patient recovered fully and remained asymptomatic. Therefore, in asymptomatic patients undergoing open sinus procedures such as malarplasty or Le Fort I osteotomy, sinus exploration and irrigation should be considered.

This case report emphasized the importance of comprehensive preoperative radiologic assessment in esthetic facial procedures that involved paranasal sinus. Although the patient was asymptomatic and immunocompetent, the incidental discovery and removal of a maxillary fungal ball during malar reduction surgery showed the potential for occult pathology to complicate surgical interventions. Clinicians should be aware of the possibility of sinus pathology, as timely intraoperative management could prevent the complications and contributed to the optimal outcomes.

ORCID

Atapol Yongvikul, <https://orcid.org/0000-0002-0432-8711>
Walop Supavanich, <https://orcid.org/0009-0004-4993-7109>
Jae-Young Kim, <https://orcid.org/0000-0002-9423-438X>
Jong-Ki Huh, <https://orcid.org/0000-0002-7381-3972>

Authors' Contributions

A.Y. participated in data collection and writing the manuscript. W.S. participated in the study design. J.Y.K. and J.K.H.

participated in the study design and coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

Funding

No funding to declare.

Acknowledgements

The authors would like to express their sincere gratitude to Assoc. Prof. Dr. Puangwan Laphthanasupkul and Assoc. Prof. Dr. Ratchapin Srisatjaluk for their valuable guidance and support throughout this study. Authors also extend our appreciation to the Department of Oral and Maxillofacial Pathology, Faculty of Dentistry, Mahidol University, for providing essential resources and technical assistance. Special thanks are also due to the Dean's Office, Faculty of Dentistry, Bangkokthonburi University, for their administrative support and encouragement.

Ethics Approval and Consent to Participate

Although Institutional Review Board (IRB) review was not required (BTU-IRB-38/2568), this case report was prepared in accordance with Health Insurance Portability and Accountability Act (HIPAA) regulations.

Consent for Publishing Photographs

Written informed consent was obtained from the patient for publication of this article and accompanying images.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

References

1. Basurrah M, Lee IH, Kim DH, Kim SW, Kim SW. Anatomical variations associated with maxillary sinus fungal ball. *Ear Nose Throat J* 2023;102:727-32. <https://doi.org/10.1177/01455613211028470>
2. Shi Q, Geng C, Wang M. Maxillary sinus mucocele with fungal ball. *J Craniofac Surg* 2023;34:e759-60. <https://doi.org/10.1097/scs.00000000000009632>
3. Raz E, Win W, Hagiwara M, Lui YW, Cohen B, Fatterpekar GM. Fungal sinusitis. *Neuroimaging Clin N Am* 2015;25:569-76. <https://doi.org/10.1016/j.nic.2015.07.004>

4. Meerwein CM, Seresirikachorn K, Lindsay B, Sacks PL, Kalish L, Campbell RG, et al. Sphenoid sinus fungal ball and reestablishing sinus function. *Laryngoscope* 2024;134:4888-92. <https://doi.org/10.1002/lary.31635>
5. Kimura M, Enomoto A, Maenishi O, Chikugo T, Sugita T. A fungal ball within a maxillary sinus with dental root canal filler and rare fungal propagules. *Pathol Int* 2019;69:360-5. <https://doi.org/10.1111/pin.12790>
6. Park WB, Kim YJ, Park JS, Han JY, Lim HC. Complication and salvage of sinus floor elevation in the maxillary sinus with asymptomatic and noncalcified fungus colonization: a case report. *J Oral Implantol* 2021;47:242-8. <https://doi.org/10.1563/aaid-joid-20-00127>
7. Kim JS, So SS, Kwon SH. The increasing incidence of paranasal sinus fungus ball: a retrospective cohort study in two hundred forty-five patients for fifteen years. *Clin Otolaryngol* 2017;42:175-9. <https://doi.org/10.1111/coa.12588>
8. Saibene AM, Allevi F, Calvo-Henriquez C, Dauby N, Dondossola D, Hervocho R, et al. Comprehensive management of paranasal sinus fungus balls: a Young-IFOS consensus statement. *Int Forum Allergy Rhinol* 2023;13:877-85. <https://doi.org/10.1002/alr.23093>
9. Lee JH, Lee BD. Characteristic features of fungus ball in the maxillary sinus and the location of intrasial calcifications on computed tomographic images: a report of 2 cases. *Imaging Sci Dent* 2020;50:377-84. <https://doi.org/10.5624/isd.2020.50.4.377>
10. Kim KH, Kim H, Lim SY, Koh IC. Periantral fungal abscess after zygoma reduction: a case report. *Arch Craniofac Surg* 2023;24:288-91. <https://doi.org/10.7181/acfs.2023.00353>
11. Mackay DR. The unfavorable result in plastic surgery: avoidance and treatment by Mimis N. Cohen and Seth R. Thaller. New York, NY: Thieme, 2018. *J Craniofac Surg* 2020;31:2375. <https://doi.org/10.1097/scs.0000000000007097>
12. Craig JR, Poetker DM, Aksoy U, Allevi F, Biglioli F, Cha BY, et al. Diagnosing odontogenic sinusitis: an international multidisciplinary consensus statement. *Int Forum Allergy Rhinol* 2021;11:1235-48. <https://doi.org/10.1002/alr.22777>
13. Matheny KE, Duncavage JA. Contemporary indications for the Caldwell-Luc procedure. *Curr Opin Otolaryngol Head Neck Surg* 2003;11:23-6. <https://doi.org/10.1097/00020840-200302000-00005>
14. Nashef A, Joachim MV, Liubin N, Abdel Raziq M, Abu El-Naaj I, Laviv A. The modified Caldwell-Luc approach for treating odontogenic maxillary sinusitis without need for functional endoscopic sinus surgery: a retrospective study. *J Oral Maxillofac Surg* 2025;83:199-207. <https://doi.org/10.1016/j.joms.2024.09.006>

How to cite this article: Yongvikul A, Supavanich W, Kim JY, Huh JK. Incidental discovery of a fungal ball during esthetic malar reduction surgery: a case report. *J Korean Assoc Oral Maxillofac Surg* 2025;51:309-313. <https://doi.org/10.5125/jkaoms.2025.51.5.309>