International Journal of Otolaryngology and Head & Neck Surgery, **2013, 2, 228-231**
Published Online November 2013 (http://www.scirp.org/journal/ijohns)
http://dx.doi.org/10.4236/ijohns.2013.26047

Solitary Fungus Ball of the Sphenoid Sinus

Faiz Alouni, Yousof Yousof, Shahram Talebian Khorasani
University of Tishreen, Lattakia, Syrian Arab Republic
Email: alounifaiz@yahoo.com, Shahram_talebian@yahoo.com

Received July 18, 2013; revised August 15, 2013; accepted September 10, 2013

ABSTRACT

A 50-year-old woman with long standing nonspecific disturbing headaches of the mid-face and rear of the head plus retro-orbital pain for about one year duration was proved to suffer from the fungus ball involvement of the left sphenoid sinus after operation. The diagnosis was established by histopathologic examination of the specimen removed at the time of operation.

Keywords: Nonspecific Headaches; Retro-Orbital Pain; Fungus Ball; Sphenoid Sinus

1. Case Presentation

A 50-year-old woman, living in the coastal city of Lattakia—Syrian Arab Republic, developed chronic headaches of nonspecific nature for more than a year before referring to our ENT clinic in Al-Asad university hospital. She was complaining of nonspecific headaches and retro-orbital pain that have affected her life and work to a great extent. During the time and before referral to our clinic, she had seen many doctors including ENT specialist but she had been diagnosed as having psychological headaches and/or as a tension headaches of natural etiology, partly pointing to the stress and hard work she had. She had been given analgesics and painkillers of different natures but indeed with no benefit. She also sought neurologic consultations prior to ENT examination, but they found no clue whatsoever pointing to sphenoid pathology. So she was finally referred to our clinic for further workup and possible diagnosis.

Upon inquiry, she did not give us any prior history of hypertension, diabetes mellitus, any hereditary or occupational disorder, as well as any disease or medicines causing immunosuppression. In physical examination and all body systems including neurologic examinations, we found no clue to indicate pathology in the sphenoid sinus at first and also the rest of the physical examination proved quite normally. Nevertheless, ENT examination did not show any significant finding. She underwent complete blood test and chemical analyses to rule out any systemic problems and the results of tests were negative and unrevealed of any predisposing factors or comorbidity elements. To reach a diagnosis and take into account the possibility of sinus involvement, CT scanning of the head was done (**Figure 1**) that showed a radio-opaque mass in the left sphenoid sinus. Taking into account the physical examination, lab analysis and CT result (**Figure 1**), our preliminary diagnosis was fungal involvement of the sphenoid sinus.

2. Discussion

2.1. Clinical Presentation

SFB produces symptoms as a result of mass effect and paranasal sinus obstruction. Medical attention is typically sought for symptoms consistent with Chronic Rhinosinusitis, although the extensive duration and refractoriness to medical therapy of a patient's facial pain, headache, nasal airway obstruction, chronic cough, or purulent rhinorrhea may be indicative of a more unusual process. Nasal endoscopy may demonstrate inflammatory polyp disease, which is found in only 10% of patients, but is more likely to reveal normal to mild mucosal inflammation without other revealing characteristics [1-4].

2.2. Radiology

CT scans are more revealing, yet certainly not diagnostic. Single sinus involvement is reported in 59% to 94% of SFB cases, almost always with complete or subtotal opacification of the involved sinus and frequently demonstrating radiodensities within such opacifications (41%). Bony sclerosis of the walls of the involved sinus is common, as radiographic evidence of this bony thickening is noted in 33% to 62% in different case series. In

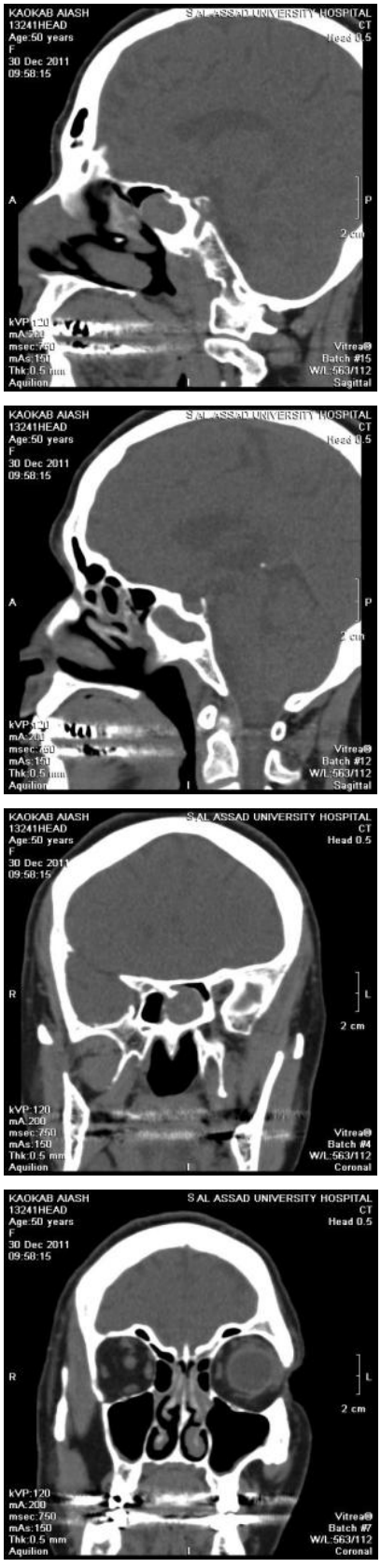

Figure 1. CT scan of the patient indicating pathology in the left sphenoid sinus.

contrast to the bony erosion commonly seen in allergic fungal sinusitis, similar sinus bony attrition is noted in only 3.6% to 17% of CT scans of SFB patients. The presence of isolated sinus opacification on CT scans will appropriately prompt either further imaging (MRI) or endoscopic surgery for both diagnostic and therapeutic purposes [1-4].

2.3. Pathology

The pathogenesis of SFB almost certainly requires the inhalation of fungal spores and sequestration into a fortuitous location within the sinonasal passages. This warm, humid location in a poorly ventilated paranasal sinus favors germination and growth as the fungus evades host immune defenses and avoids clearance from the sinuses by mucociliary transport. Although difficult to identify in cultures of SFB specimens, Aspergillus is the overwhelmingly most common pathogen responsible for the condition. Histopathologic review of associated sinus mucosa demonstrates a mild to moderate infiltration of chronic inflammatory cells in the absence of tissue invasion, granulomas, or allergic fungal mucin. SFB preferentially involves the maxillary sinus (69% to 86% of cases), and, in as many as 50% of cases, this may be attributable to favorable conditions for Aspergillus growth as a result of zinc oxide diffusing into the maxillary sinus from dental paste used in endodontic procedures performed on maxillary teeth [1-4].

2.4. Treatment

SFB is a noninvasive fungal disease that can be adequately treated by complete surgical removal of the fungal ball and thorough irrigation of the involved sinus. Although traditionally addressed through external approaches, most authors report endoscopic techniques to be effective in complete extirpation of the disease; however, trephinations for irrigation or endoscope ports as well as external approaches should be considered in more challenging cases. Recurrence rates of 3.7% to 6.8% in SFB patients treated endoscopically is probably acceptable, because further removal of SFBs can then be performed through widely patent surgical antrostomies in the office or operating room setting. Postoperative antifungal therapy is not necessary unless the patient suffers from comorbid conditions with predispositions to compromised immune function. Progression from SFB to AFIFS, although thought to be unusual, has been reported in high-risk patients, patients with blood dyscrasias, diabetes, systemic steroids, or other similar conditions associated with immunodeficiency. Antifungal selection in these rare cases should be guided by fungal histology and culture results to identify the least toxic, most cost-effective agent available, and topical therapy

with intranasal irrigations should be considered. Amphotericin B formulations should be restricted to cases in which fungal culture results suggest resistance to imidazole antifungals [1-4].

2.5. Significance of the Case Report

From literature review concerning diagnosis and management of isolated sphenoid fungal involvement we found that this isolated lesion is extremely rare especially in immunocompetent patients, it is frequently difficult to diagnose, as patients present with nonspecific symptoms such as headaches, visual disturbances and cranial nerve palsies. Diagnosis of the disease is typically not made until advanced imaging has been developed. Sinus Fungal Ball (SFB), formerly and inaccurately referred to as "mycetoma" best typifies noninvasive fungal disease of the paranasal sinuses. This disease state was first described by Mackenzie in 1893 and has only been recently well-characterized, most likely as a result of the small size of reported case series and the infrequency with which physicians encounter this condition in their daily practices. SFB results from sequestration within a paranasal sinus of densely tangled, concentrically arranged masses of fungal hyphal elements in the absence of mucosal invasion or granulomatous reactions [5-18].

3. Our Approach to Treatment

Following physical examination and after receiving the result of lab and imaging diagnostic workups (**Figure 1**), we decided to undertake FESS (Functional Endoscopic Sinus Surgery) at Al-Asad hospital in Lattakia using computer assisted navigation (**Figure 2**) to remove the pathology most probably differentiated as a fungus ball. At the time of the operation, we noticed that the frontal bony part of the sinus was completely destroyed by the fungus, however, other walls of the left sphenoid sinus remained intact. The sinus approached only endoscopically and the fungus ball completely removed as can be seen by the serial pictures taken by Navigation system and the endoscopic camera equipment (**Figure 2**). The patient was discharged from the hospital after 48 hours without any complications and the histopathologic report of the mass later showed that the fungus ball composed of Aspergillus Nigra (**Figure 3**).

4. Follow Up

The patient was then followed up for a period of 6 months and all headaches and problems which she was complaining about at the time of presentation were totally resolved, and on nasal endoscopy undertaken a month or so after the operation, the following picture was taken from the sphenoid sinus, showing that it is free from any

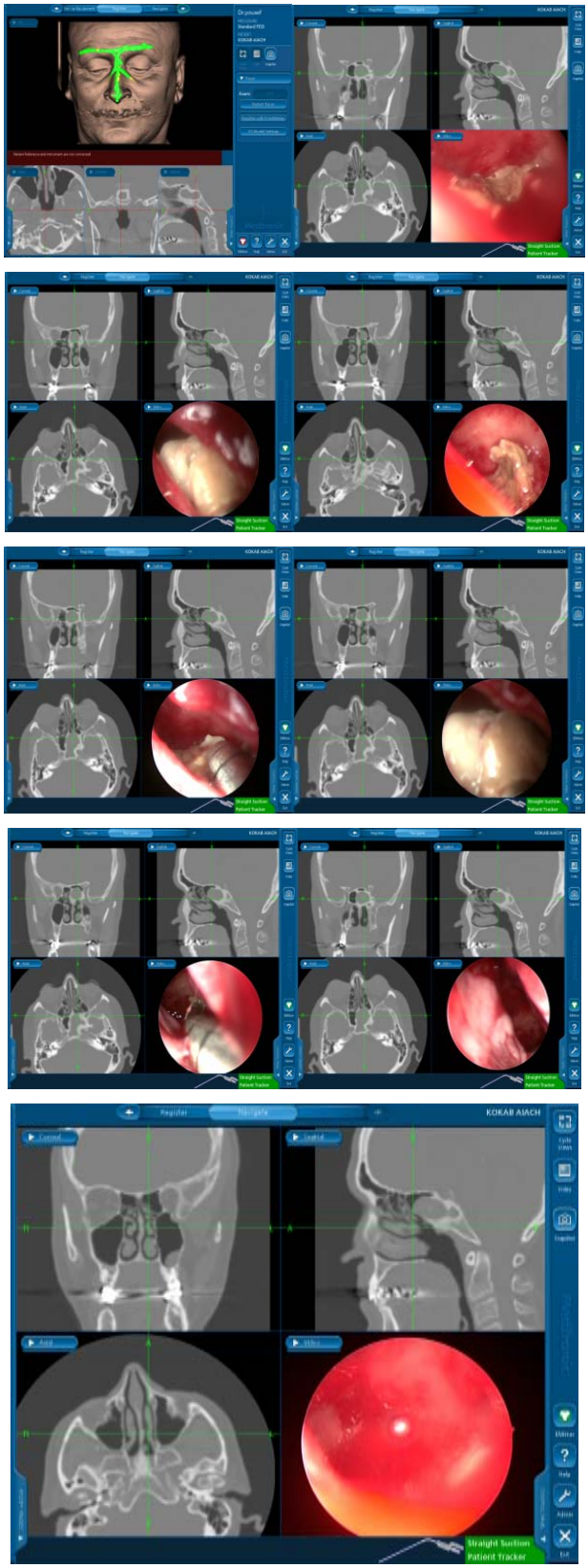

Figure 2. Pictures taken at the time of the operation of the patient with solitary fungus ball of the left sphenoid sinus with navigation equipment.

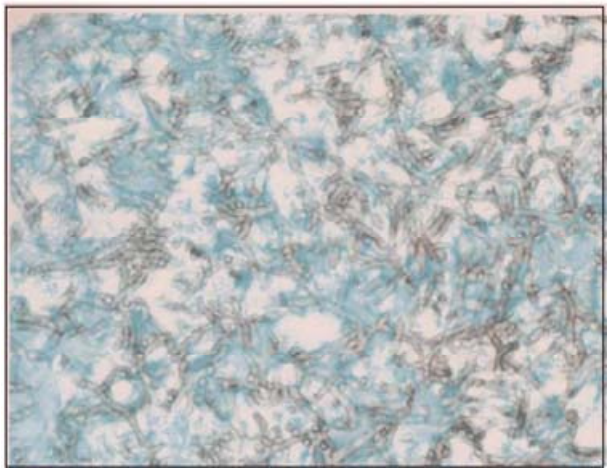

Figure 3. Histopathologic examination of the specimen taken from left sphenoid sinus.

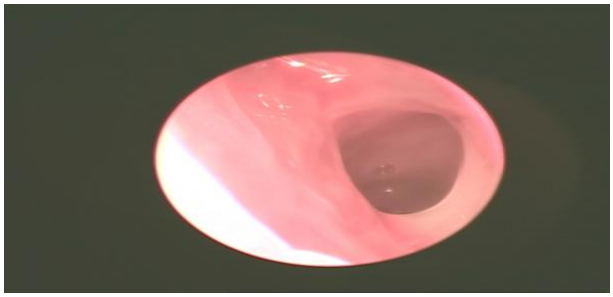

Figure 4. Nasal endoscopy undertaken a month or so after the operation.

recurrence or re-establishment of the fungi (**Figure 4**).

REFERENCES

[1] B. J. Bailey, "Head & Neck Surgery—Otolaryngology," 4th Edition, Lippincott Williams & Wilkins, Philadelphia, 2006.

[2] P. W. Flint, B. H. Haughey, *et al.*, "Cummings Otolaryngology—Head & Neck Surgery," 5th Edition, Mosby, 2010.

[3] A. K. Lalwani, *et al.*, "Current Diagnosis and Treatment in Otolaryngology," 2nd Edition, McGraw-Hill Companies, New York, 2007,

[4] E. R. Thaler and D. W. Kennedy, "Rhinosinusitis—A Guide for Diagnosis and Management," Springer, Berlin, 2008. http://dx.doi.org/10.1007/978-0-387-73062-2

[5] D. Lew, F. S. Southwick, W. W. Montgomery, A. L. Weber and A. S. Baker, "*Sphenoid sinusitis*. A Review of 30 Cases," *New England Journal of Medicine*, Vol. 309, No. 19, 1983, pp. 1149-1154. http://dx.doi.org/10.1056/NEJM198311103091904

[6] J. Y. Li, T. Y. Yong, E. Khoo, G. R. Russ, D. I. Grove, P. T. Coates, *et al.*, "Isolated Sphenoid Fungal Sinusitis in a renal Transplant Recipient Presenting with Bilateral Abducens Nerve Palsy," *Transplant International*, Vol. 20, No. 7, 2007, pp. 640-642. http://dx.doi.org/10.1111/j.1432-2277.2007.00490.x

[7] D. S. Sethi, "Isolated Sphenoid Lesions: Diagnosis and Management," *Otolaryngology—Head and Neck Surgery*, Vol. 120, No. 5, 1999, pp. 730-736. http://dx.doi.org/10.1053/hn.1999.v120.a89436

[8] Y. C. Hsu, C. Y. Su, R. F. Hsu, F. Y. Kuo and M. J. Hsieh, "Abducens Palsy in Acute Isolated Sphenoid Fungal Sinusitis," *Journal of Laryngology & Otology*, 2003, Vol. 33, No. 5, pp. 319-321.

[9] T. J. Martin, T. L. Smith, M. M. Smith and T. A. Loehrl, "Evaluation and Surgical Management of Isolated Sphenoid Sinus Disease," *Archives of Otolaryngology—Head and Neck Surgery*, Vol. 128, No. 12, 2002, pp. 1413-1419. http://dx.doi.org/10.1001/archotol.128.12.1413

[10] A. Friedman, P. S. Batra, S. Fakhri, M. J. Citardi and D. C. Lanza, "Isolated Sphenoid Sinus Disease: Etiology and Management," *Otolaryngology—Head and Neck Surgery*, Vol. 133, No. 4, 2005, pp. 544-550. http://dx.doi.org/10.1016/j.otohns.2005.04.023

[11] Z. M. Wang, N. Kanoh, C. F. Dai, D. I. Kutler, R. Xu, F. L. Chi, *et al.*, "Isolated Sphenoid Sinus Disease: An Analysis of 122 Cases," *The Annals of Otology, Rhinology, and Laryngology*, Vol. 111, No. 4, 2002, pp. 323-327.

[12] S. W. Kim, D. W. Kim, I. G. Kong, D. Y. Kim, S. W. Park, C. S. Rhee, *et al.*, "Isolated Sphenoid Sinus Diseases: Report of 76 Cases," *Acta Oto-Laryngologica*, Vol. 128, No. 4, 2008, pp. 455-459. http://dx.doi.org/10.1080/00016480701762466

[13] W. Lawson and A. Reino, "Isolated Sphenoid Sinus Disease: An Analysis of 132 Cases," *Laryngoscope*, Vol. 107, No. 12, 1997, pp. 1590-1595. http://dx.doi.org/10.1097/00005537-199712000-00003

[14] J. A. Socher, M. Cassano, C. A. Filheiro, P. Cassano and A. Felippu, "Diagnosis and Treatment of Isolated Sphenoid Sinus Disease: A Review of 109 Cases," *Acta Oto-Laryngologica*, Vol. 128, No. 9, 2008, pp. 1004-1010. http://dx.doi.org/10.1080/00016480701793735

[15] Y. A. Nour, A. Al-Madani, A. El-Daly and A. Gaafar, "Isolated Sphenoid Sinus Pathology: Spectrum of Diagnostic and Treatment Modalities," *Auris Nasus Larynx*, Vol. 35, No. 4, 2008, pp. 500-508. http://dx.doi.org/10.1016/j.anl.2007.10.011

[16] T. J. Lee, S. F. Huang, C. C. Huang and Y. L. Chen, "Isolated Sphenoid Sinus Aspergillosis: Report of Two Cases," *Chang Gung Medical Journal*, Vol. 25, No. 10, 2002, pp. 464-468.

[17] J. M. Klossek, E. Serrano, L. Péloquin, J. Percodani, J. P. Fontanel and J. J. Pessey, "Functional Endoscopic Sinus Surgery and 109 Mycetomas of Paranasal Sinuses," *Laryngoscope*, Vol. 107, No. 1, 1997, pp. 112-117. http://dx.doi.org/10.1097/00005537-199701000-00021

[18] T. J. Lee, S. F. Huang, C. C. Huang and Y. L. Chen, "Isolated Sphenoid Sinus Aspergillosis," *Chang Gung Medical Journal*, Vol. 25, No. 7, 2002, pp. 464-468.