

Reversible Neuropraxic Visual Loss Induced by Allergic Aspergillus Flavus Sinomycosis

Mohammad Attallah, Mustafa Hashash, Hamad Al-Muhaimeed, Surayie Dousary, Abdulrahman Al Rabah, and Suliman Kharashi

ABSTRACT

This work reports a patient with visual loss treated successfully with surgical removal of the Aspergillus flavus sinomycosis. Vision was partially reversed within hours after surgery before starting planned corticosteroid therapy. The patient's visual acuity continued to improve steadily until it became equal to that of the other eye. The immediate gain in vision and continued improvement without corticosteroid therapy suggest a new hypothesis for visual loss induced by allergic sinonasal Aspergillosis. Simple mechanical pressure alone of the aspergillus mass over the nerve can produce visual loss, and this loss is reversed by removing the mass without corticosteroid therapy. (American Journal of Rhinology 13, 4:295–298, 1999)

Visual loss has been known to complicate bacterial sinusitis.¹ Some authors report reversal of the visual loss after treating the sinusitis,^{2–4} whereas others note no return of vision after similar interventions.⁵

Visual loss has also been reported after sino-nasal mycosis. Return of vision depends on the magnitude of the mycotic lesion, type of fungus, and patient immunity. Bipolaris sinomycosis is noted to cause primary impaired ocular mobility, proptosis, and loss of vision that can be reversed by early surgical drainage with corticosteroids and anti-fungal therapy.⁶ Permanent visual loss secondary to Fusarium sinomycosis spreading to cause endophthalmitis has been reported in an immuno-compromised

patient who was suffering from acute lymphocytic leukemia.⁷

Visual loss also is known to occur after Aspergillus sinomycosis. The invasive form has a poor prognosis for return of vision, but the allergic variant can be reversed by debulking the Aspergillus flavus mass in conjunction with corticosteroid therapy.⁸ Such treatment assumes that the lost vision was partially due to allergic reaction involving the optic nerve, and that this reaction could be reversed with steroid therapy.

This article reports a case treated only by surgical decompression that postulates a new hypothesis for the pathogenesis of the visual loss induced by allergic sinonasal Aspergillosis.

Case Report

A 15-year-old Saudi male presented with a 4-day history of severe right-sided headache. He also complained of progressive decrease in vision over the past 6 months associated with bilateral nasal obstruction and purulent discharge. The patient was suspected of having aspergillus sinomycosis 2 years earlier, and a CT scan at that time showed opacification of the paranasal sinuses on the right side. He had been scheduled for functional endoscopic sinus surgery (FESS) but did not report for surgery.

On examination, there was ballooning of the right lateral wall of the nose, with bilateral mucosal swellings and purulent discharge. Ophthalmologic evaluation showed abnormal projection of the right globe anteriorly and laterally, unilateral telecanthus, and epiphora. There was complete visual loss, a pale temporal region of the fundus, and absence of the superior arterial branch of the macula. (Fig. 1 and 2). Retinal edema and/or venous engorgement was not observed. Ocular mobility was normal. The left eye was

From the King Abdulaziz University Hospital, Riyadh, Saudi Arabia

Address correspondence and reprint requests to Dr. Mustafa Hashash, King Abdulaziz University Hospital, P.O. Box 245, Riyadh 11411, Saudi Arabia

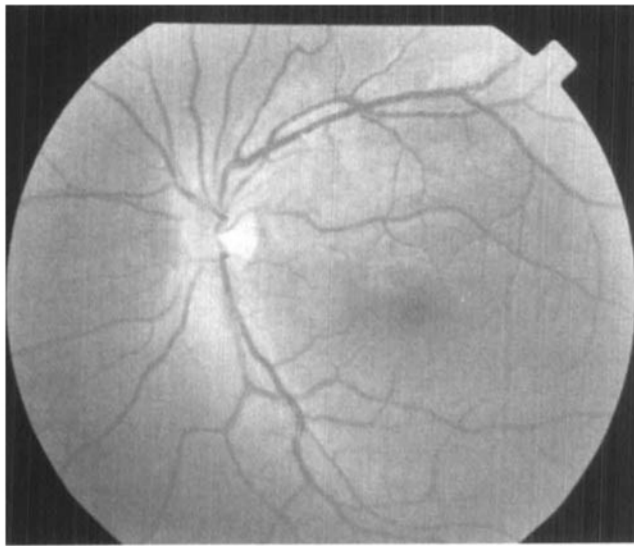


Figure 1. Photograph of left normal retina.

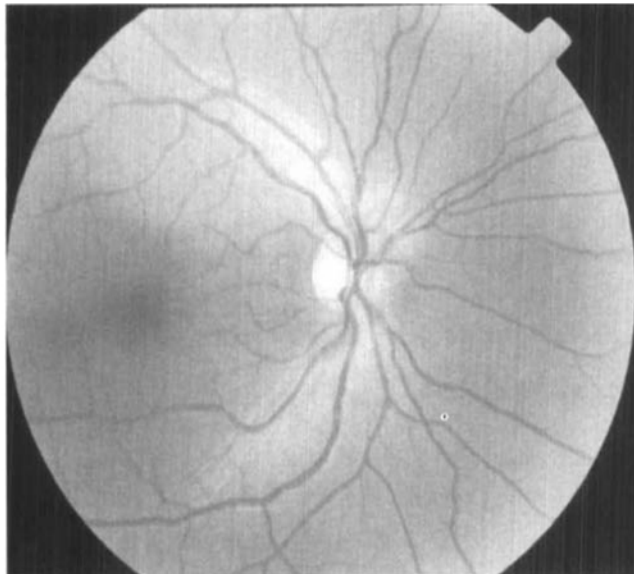


Figure 2. Photograph of right retina showing absent blood vessel in temporal region with subsequent paleness in this area compared to left. There is no evidence of venous engorgement or retinal edema.

noted to be normal. The neurological examination did not suggest any intracranial involvement.

The aspergillus precipitins titre was highly positive. A nasal smear for fungi was negative. CT scans of the paranasal sinus showed bulging of the walls of the right ethmoid, maxillary, and sphenoid sinuses by a heterogenous tissue with patchy calcification (Figs. 3 and 4). The right lamina papyracea was displaced laterally, but no bone erosion or intraorbital involvement was observed. The clivus appeared eroded, and a soft tissue density was felt to distort the anterior cerebral arteries (Fig. 4). On the left side the ethmoid sinus also showed expansion and the maxillary sinus was uniformly cloudy (Fig. 3). The patient was treated



Figure 3. Preoperative axial CT showing pan sinusitis and left nasal septum deflection. No heterogenous materials is in the left maxillary sinus. The right anterior group of the sinus shows heterogenous opacity with ballooning of the ethmoids.



Figure 4. Preoperative coronal CT cut showing right posterior group of sinuses with heterogenous opacity with intracranial extension above roof of involved sphenoid sinus.

with a conventional and endoscopic spheno-ethmoidectomy, right uncinectomy, right inferior and middle turbinectomy, and left functional endonasal sinus surgery. Fungus hyphae were suspected in the frozen section. The surgery removed polyps from the right ethmoid and muddy amorphous material from the ethmoid and sphenoid sinuses. The walls of the sinus, although distorted, were intact. Culture revealed heavy growth of *Aspergillus Flavus*. The excised polyps, sent for histopathological examination, revealed intense inflammatory reactions without evidence of fungal invasion.

Postoperatively, the patient felt immediate improvement of the headache and nasal obstruction (Figs. 5 and 6). After a few hours, the patient was able to perceive light in his right eye. Two weeks later the proptosis and telcanthus



Figure 5. Postoperative coronal CT of the paranasal sinus 48 hours postoperatively.



Figure 6. Postoperative axial CT showing sphenoid sinus 48 hours postoperatively.

showed marked improvement together with the vision, which became close to normal before the start of fungicidal therapy. Itraconazol, an oral antifungal agent (200 mg BID), was ordered for 6 months for the possible intracranial extension. The patient returned 1 year later, at which time a CT scan showed almost complete clearing of the disease. The nose and sinuses were well aerated and the intracranial shadows disappeared (Figs. 7 and 8). Visual acuity was found to be normal.

DISCUSSION

The ethmoid sinuses are separated from the orbit by the lamina papyracea. This bony barrier is thin and commonly exhibits some openings that may allow infection to gain access to the orbit. As a result, the periorbita in this area may become involved, resulting in subperiosteal abscess.

This infection can easily involve the adjacent soft tissue:



Figure 7. Coronal CT showing paranasal sinuses one year later.



Figure 8. Coronal CT showing sphenoid sinus at 1 year postoperatively with healthy mucosal lining and excellent aeration. There is no evidence of intracranial disease.

thereby, the optic nerve sheath spread of infection from the sphenoid sinus is also possible. Usually the thicker bone and firm attachment of periosteum limits spread, but Renn and Rhotoh⁹ showed in the human cadaver that 4% of the optic nerve canal had segments covered only by leptomeninges and sphenoidal sinus mucosa. This may explain the vulnerability of the optic nerve when an adjacent sphenoidal sinusitis exists.⁵

Orbital infection in the form of orbital cellulitis, subperiosteal or orbital abscess is often manifested clinically by proptosis, ophthalmoplegia, eyelid edema, chemosis, and visual loss. On the other hand, orbital apex syndrome can

present with an isolated visual loss with minimal early orbital signs. Such a condition suggests direct extension from posterior ethmoidal or sphenoidal sinusitis.⁵

The return of vision after treating mycotic sinusitis depends on type of fungus, site of inflammatory reaction, general condition of the patient, and therapeutic agent used. The examples of visual loss that are associated with sinomycosis are as follows:

- a. Reversible or irreversible visual loss can result from Bipolaris Sinomycosis.⁶ The visual loss induced by Endogenous Fusarium sinomycosis can be reversed by prompt clearing of the fungus and inflammatory tissue and postoperative fungicidal therapy. Irreversible visual loss can be seen in immunocompromised patients with the same fungus.⁷
- b. Irreversible visual loss can occur from an invasive form of Aspergillosis.⁸ The pathophysiology is believed to be due to extension of the fungal inflammatory tissues into the orbit, involving the exposed intraorbital segment of the optic nerve. On the other hand, there is reversible visual loss on cases of allergic variants of the Aspergillosis that is believed to be secondary to a pressure effect of the mycotic mass and allergic reaction. This loss can be reversed only by removing the fungus tissue and adjuvant corticosteroids.⁶

In the present case, the absence of ophthalmoplegia, retinal edema, and venous engorgement with immediate postoperative partial regain of visual acuity without the use of corticosteroids suggests that the visual loss was due only to a pressure phenomenon that could be treated with surgical removal of tissues alone.

SUMMARY AND CONCLUSION

A case of total visual loss produced by *Aspergillus Flavus* Sinomycosis is presented. Conventional and endoscopic debridement of the fungus mass without the use of adjuvant corticosteroids resulted in partial regaining of vision within a few postoperative hours. The absence of ophthalmoplegia, retinal edema, and venous engorgement with the rapid postoperative regaining of vision suggest that the visual loss was due to compression of the optic nerve induced by mechanical pressure of the allergic *Aspergillus* sinomycotic mass.

REFERENCES

1. Tarazi AE, Shikani AH. Irreversible unilateral visual loss due to acute sinusitis. *Arch Otolaryngol Head Neck Surg* 117; 1991.
2. El Sayed YA, Al-Muhaimed HS. Acute visual loss in association with sinusitis. *J Laryngol Otol* 107:840-842, 1993.
3. Coaliti L, Baredes S, Mauriello J, Frohman L. Visual loss reversal after treatment of acute bacterial sinusitis. *Laryngoscope* 106: 148-151, 1996.
4. Galati LT, Baredes S, Mouriello J, Frohman L. Visual loss reversed after treatment of acute bacterial sinusitis. *Laryngoscope* 106(2 Pt 1):148-151, 1996.
5. Slavin NL, Glaser JS. Acute severe irreversible visual loss with sphenothmoiditis (posterior orbital cellulitis). *Arch Ophthalmol* 105:345-348, 1987.
6. Jay WM, Bradher RW, LeMay B, et al. Ocular involvement in mycotic sinusitis caused by bipolaris. *Am J Ophthalmol* 105:366-370, 1988.
7. Patel AS, Hemady RK, Rodrigues M, et al. Endogenous fusarium endophthalmitis in a patient with acute lymphocytic leukemia. *Am J Ophthalmol* 117:363-368, 1994.
8. Dunlop IS, Billson FA. Visual failure in allergic aspergillus sinusitis: Case report. *Br J Ophthalmol* 72:127-130, 1988.
9. Renn W, Rhotoh A. Microsurgical anatomy of the sellar region. *J Neurosurgery* 43:228-298, 1975. □

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.