

Three Cases of Brain Intraparenchymal Coccidioidomycosis

BACKGROUND

Intraparenchymal Coccidioidomycosis (Cocci) is a rare form of disseminated Central Nervous System (CNS) infection.

METHODS

153 cases of CNS Cocci between 1987-2014 at Kern Medical reviewed. Three cases of intraparenchymal were found.

INTRODUCTION

- Coccidioidomycosis is caused by the dimorphic fungi of genus *Coccidioides* which includes *C.Immitis* and *C.Posadasii*
- Endemic to southern Arizona, central and southern valleys of California, southwestern New Mexico and west of Texas in the United States
- Caused by inhalation of spores, thus human to human transmission is not permitted
- Clinical manifestations range from self-limiting pneumonia which is also known as valley fever to disseminated disease
- Disseminated disease include the skin or subcutaneous soft tissue, meninges of the brain and spinal cord and bones
- Central nervous system Coccidioidomycosis primarily involves the meninges
- Total of 39 cases of intraparenchymal coccidioidomycosis reported in literature, not including the cases here



Image 1: Obtained from public health department. Right top hand corner showing Cocci culture, right bottom showing colony, and left side incubation.

CASE PRESENTATIONS

Case 1:

57 year old male with pulmonary Cocci with dissemination to CNS with meningitis and spinal arachnoiditis. He failed fluconazole and was placed on voriconazole. He developed encephalitis and MRI brain showed nodule in the deep posterior right frontal lobe with surrounding edema plus asymmetric enhancement of the meninges of the left middle cranial fossa and left aspect of the tentorium as well as adjacent temporal lobe. He was placed on prolonged course of intravenous liposomal amphotericin with near resolution of symptoms and neuroimaging abnormalities.

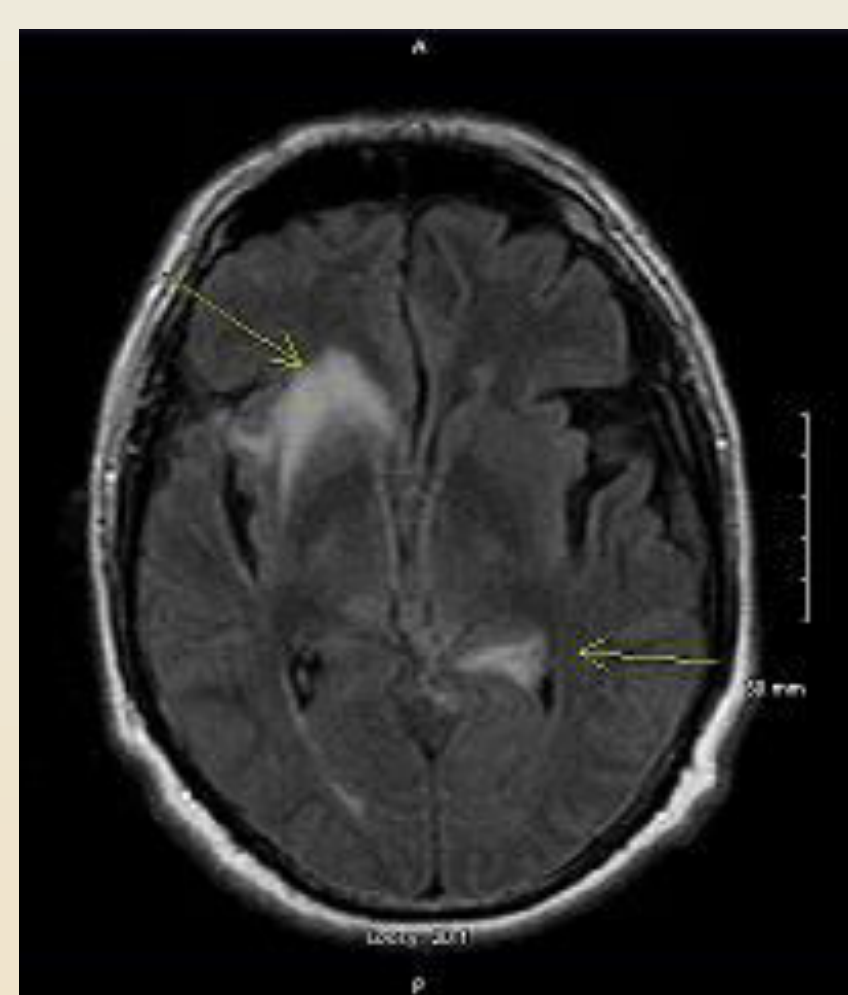


Image 1: Flair MRI showing abnormal enhancing lesions right frontal lobe and left tentorium. 2012

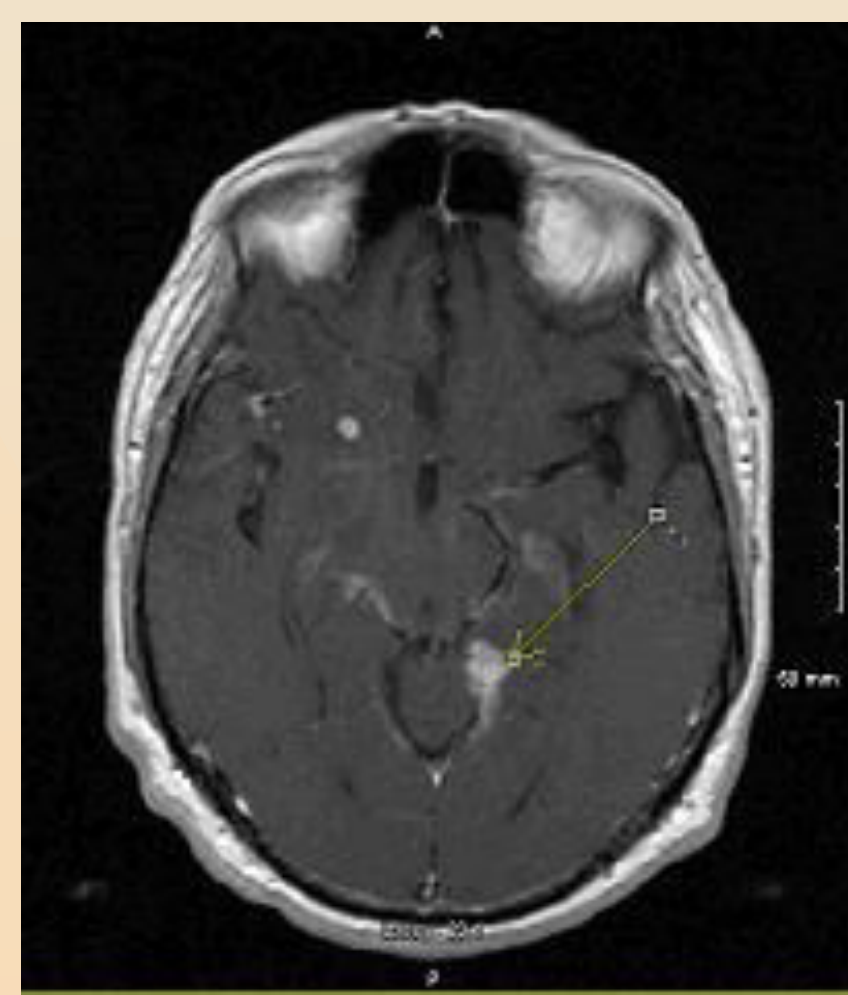


Image 3: T1 Axial + GAD, showing abnormal enhancement around the brain stem. 2012

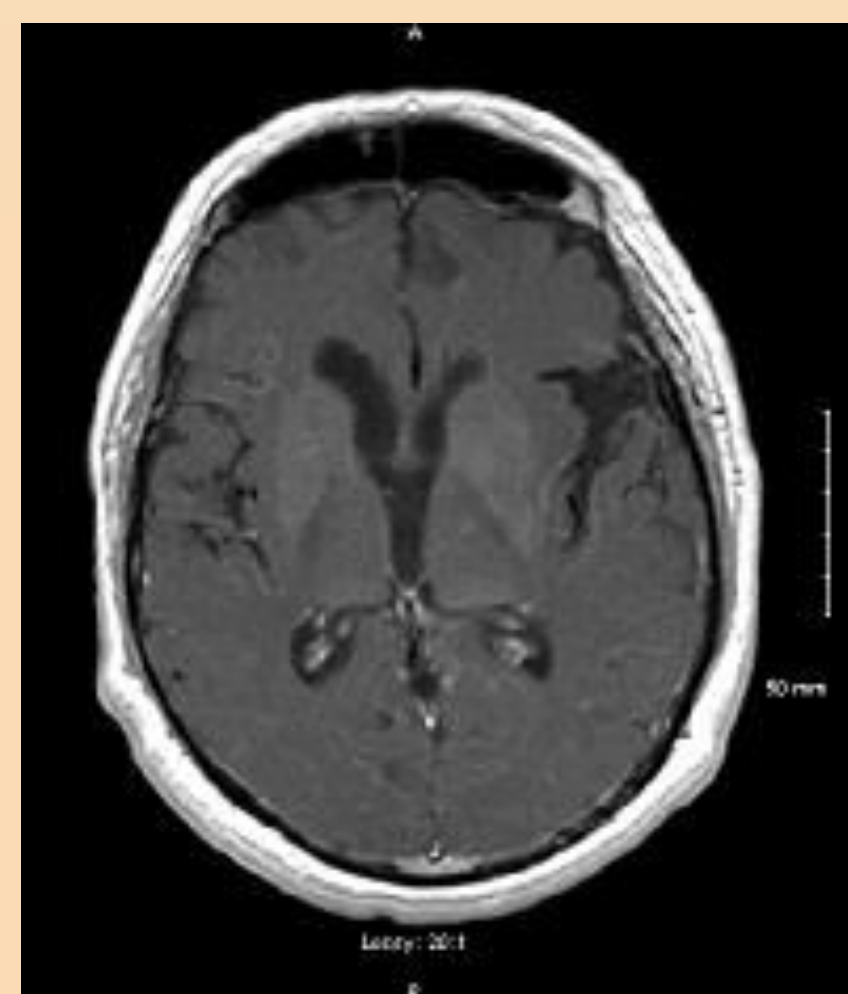


Image 5: T1 Axial + GAD, showing resolution of lesions in the frontal lobe and tentorium. 10/2016

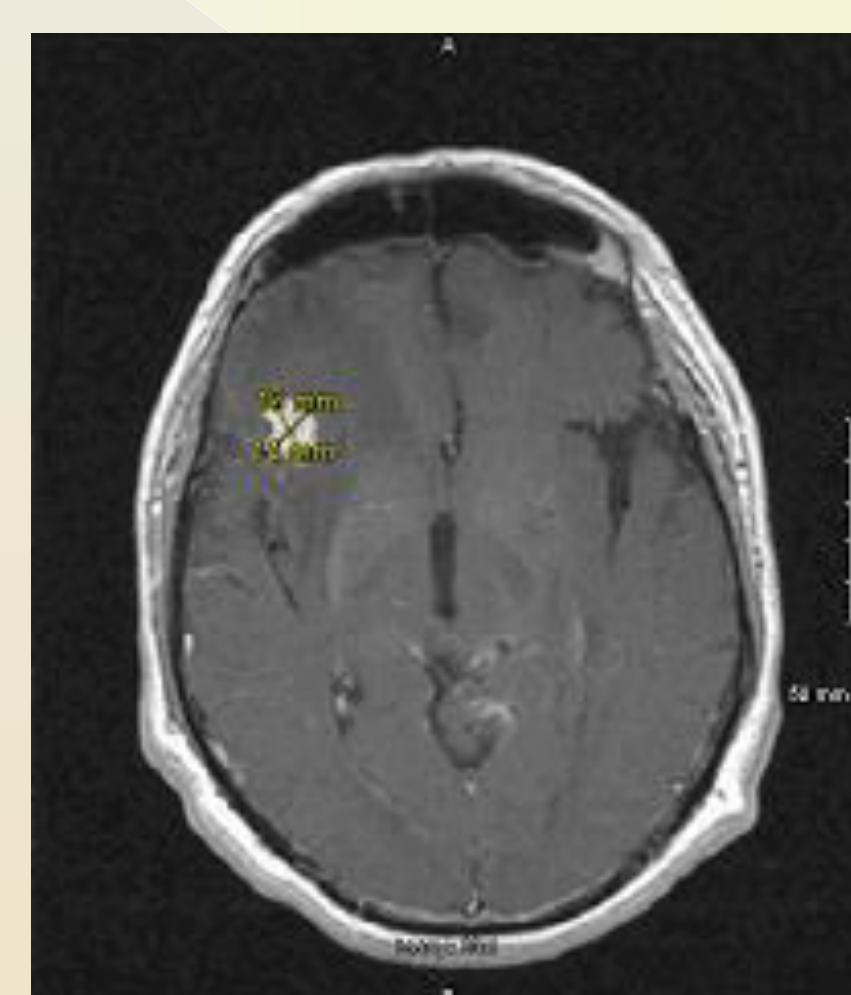


Image 2: T1 Axial + GAD, showing abnormal enhancing lesions right frontal lobe. 2012

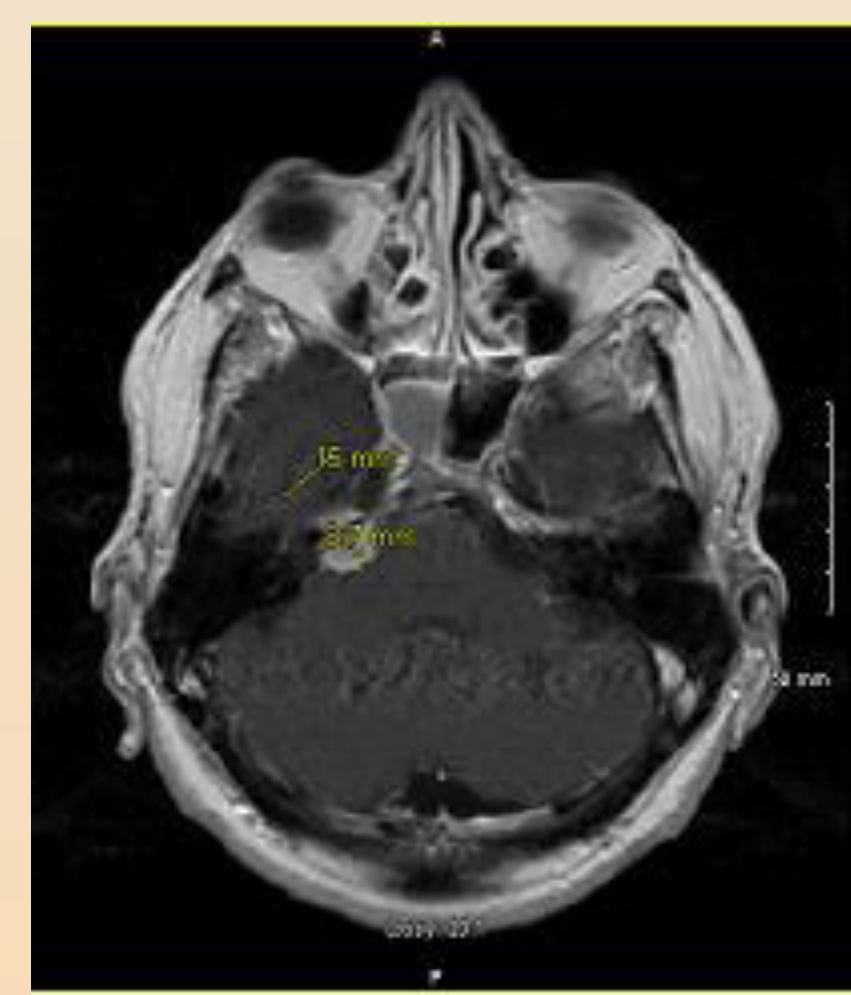


Image 4: T1 Axial + GAD, showing abnormal enhancement in right frontal lobe. 2012

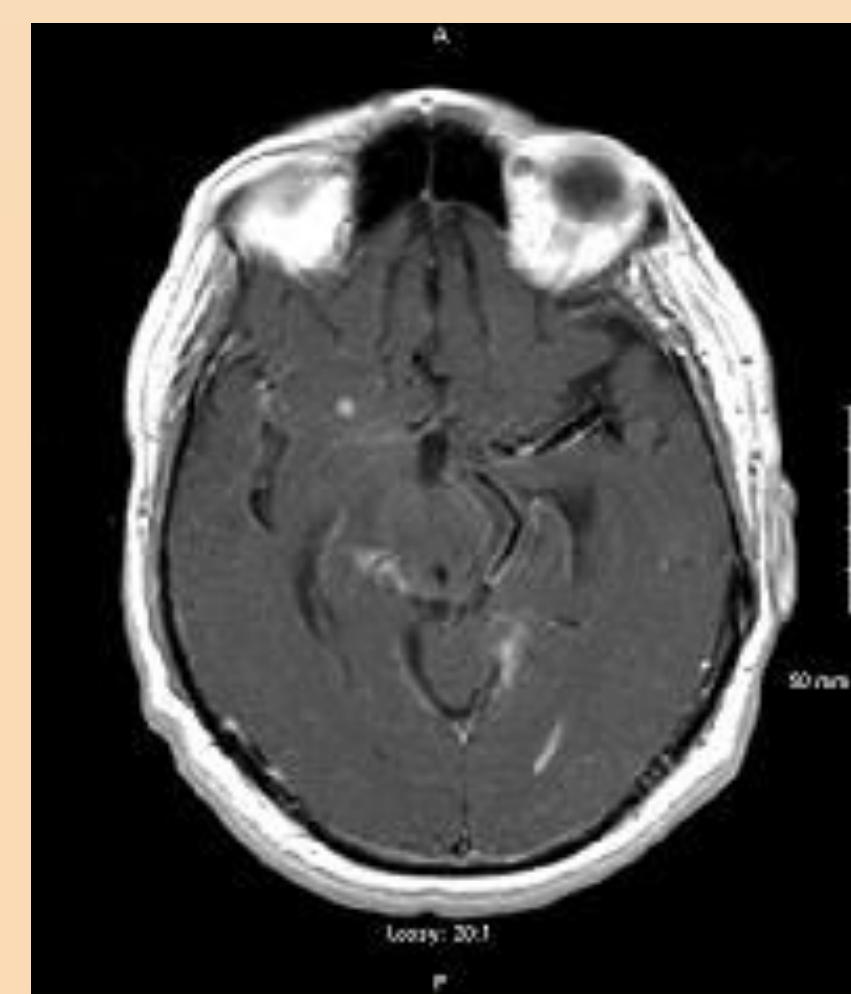


Image 6: T1 Axial + GAD, showing resolution of lesion in the brain stem. 10/2016

Case 2:

27 year old male with acquired immunodeficiency syndrome with pulmonary Cocci who failed fluconazole. He was found to have dissemination to soft tissue, osseous, lymph nodes and vocal cords. He was placed on intravenous liposomal amphotericin and tapered to oral posaconazole. Later he developed sudden onset diplopia. His brain MRI showed new enhancing lesion at right upper paramesencephalic and suprasellar cistern. His lumbar spinal fluid confirmed meningitis. He was started on intrathecal amphotericin via ommaya reservoir with near resolution of symptoms and neuroimaging abnormalities.

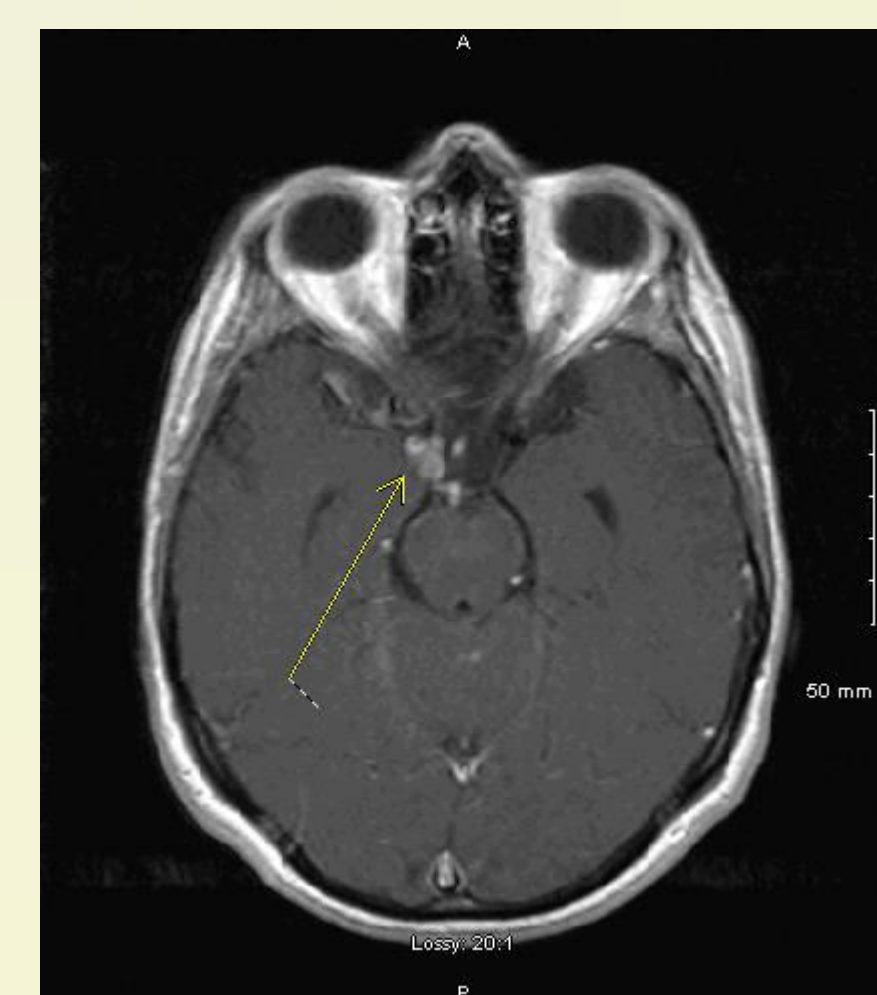


Image 1: MRI T1 Axial + GAD showing suprasellar enhancing lesion. 2014

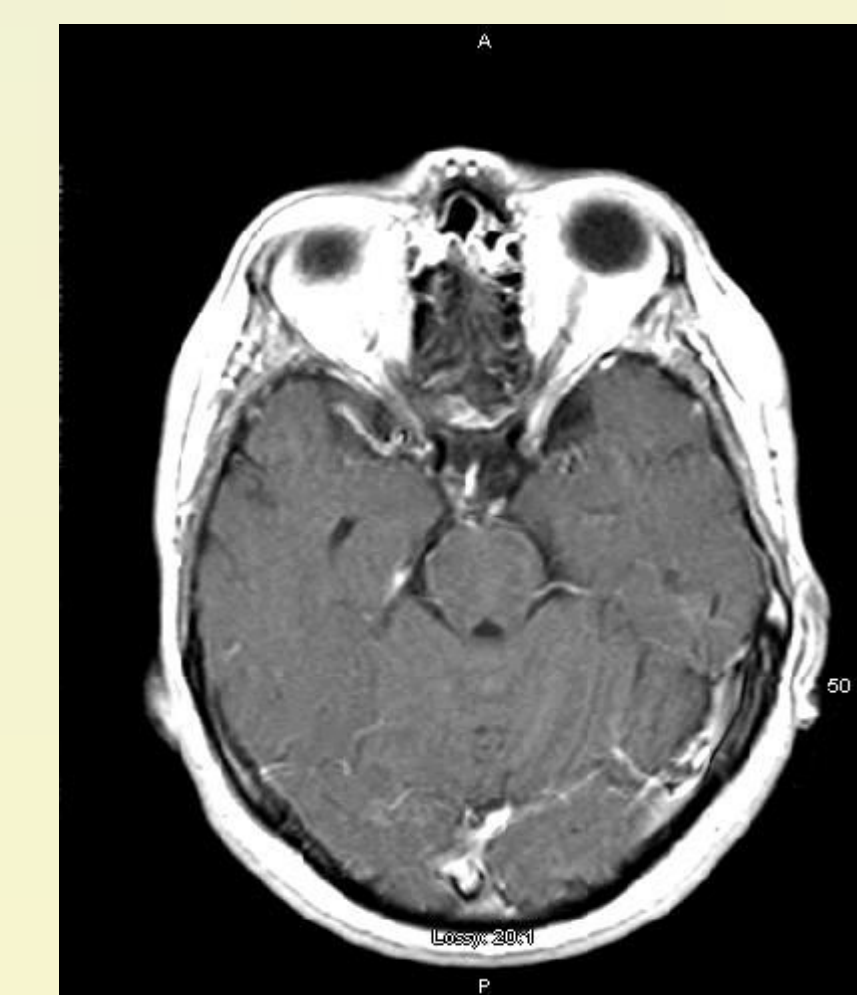


Image 2: MRI T1 Axial + GAD showing resolution of suprasellar enhancing lesion. 5/2016

Case 3:

36 year old male with cavitary and miliary pulmonary Cocci. He was found to have dissemination to cutaneous, osseous and lymph nodes. Later he developed encephalitis and seizure. His brain MRI showed multiple enhancing lesions at cerebellum, both occipital lobes, inferior right frontal lobe, left lateral geniculate body and the left cerebellar in addition to an abnormal signal extending along the left optic tract toward the lateral geniculate body extending into the white matter of the posterior temporal lobe. He was placed on high dose fluconazole with improvement of his symptoms.

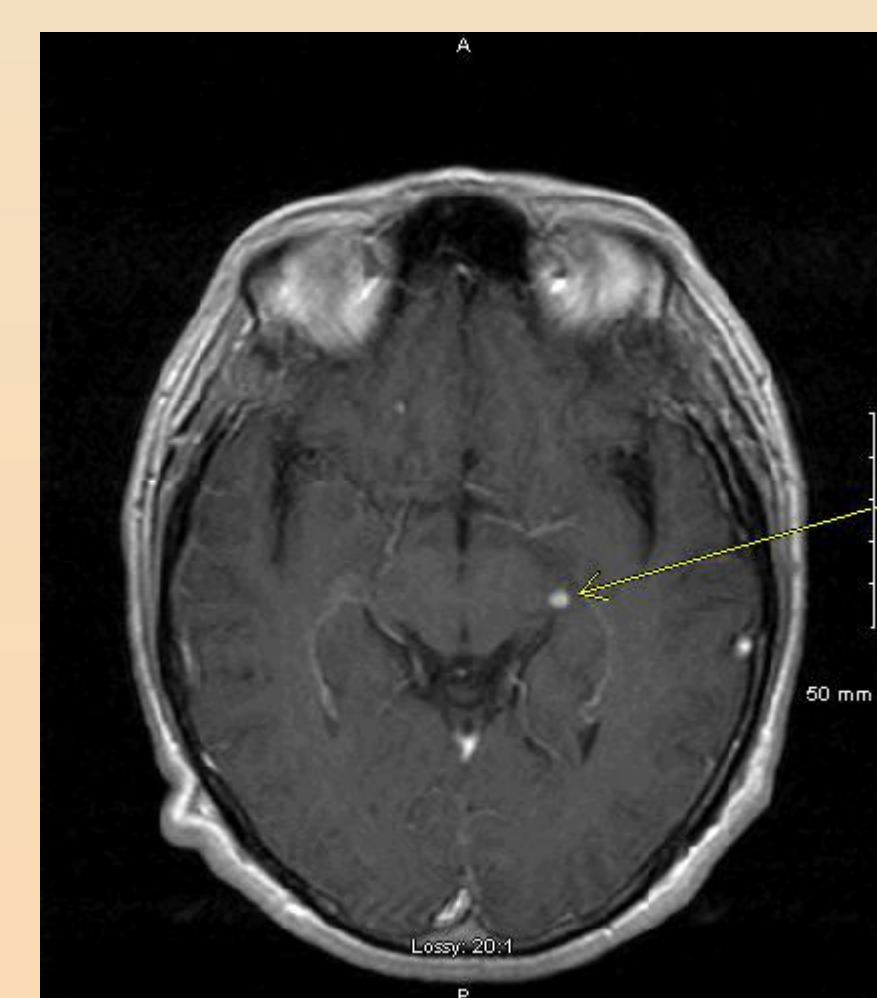


Image 1: MRI T1 Axial + GAD showing lesion to left geniculate body. 2014

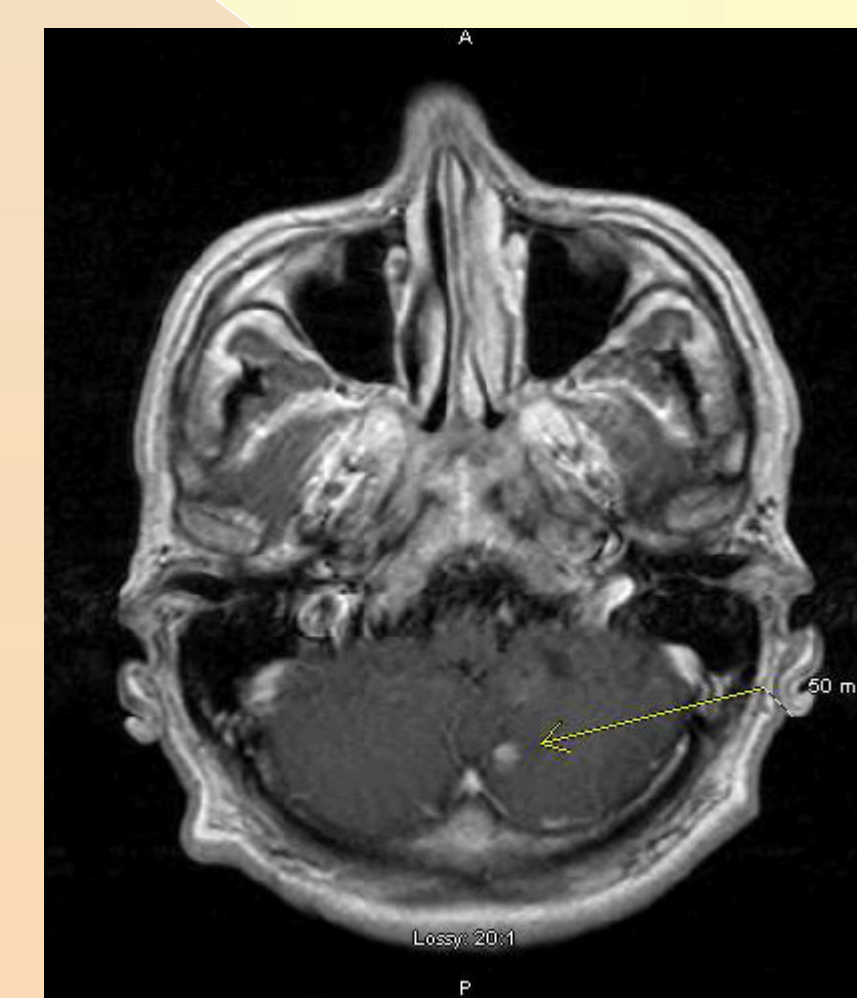


Image 2: MRI T1 Axial + GAD showing cerebellar lesion. 2014

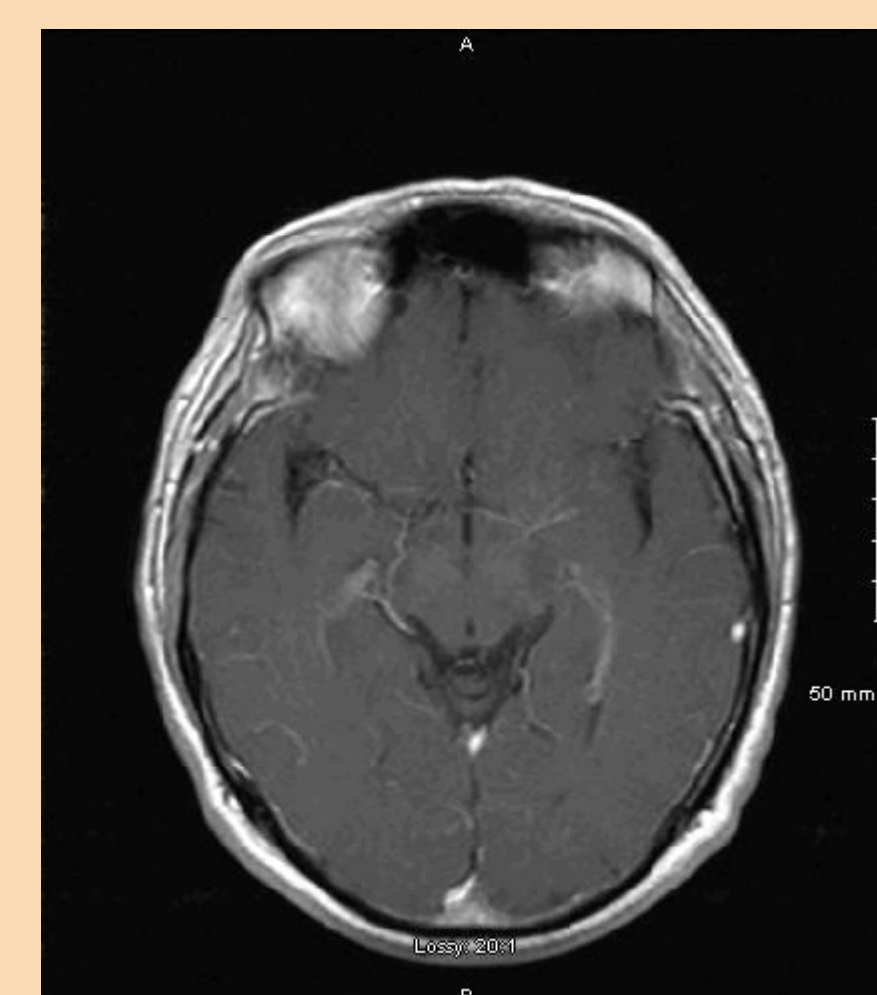


Image 3: MRI T1 Axial + GAD showing resolution of lesion to left geniculate body. 8/2016



Image 4: MRI T1 Axial + GAD showing resolution of cerebellar lesion. 8/2016

DISCUSSION

- All 3 cases were males
- Most common presenting symptoms: Headaches, Encephalopathy
- Diagnosis: Serologic tests is the most common method for diagnosis, however, definitive diagnosis is performed with direct examination of the smear with KOH preparation or calcofluor white staining
- Areas of brain involved: Frontal lobe, Temporal lobe, Occipital lobe, Suprasellar cistern, Cerebellum, Lateral geniculate body
- All cases but one showed fluconazole therapy failure
- Total number cases to date, 42 since 1905

Treatment Course:

Case 1: Fluconazole 1000mg/day → Fluconazole 1200mg/day → Voriconazole 300mg BID → Ambisome IV + INF gamma 100mg x3/week → Intrathecal Amphotericin + Voriconazole 300mg BID

Case 2: Amphotericin 2mg/kg IV → Posaconazole 400mg BID + ABLC → Fluconazole → Posaconazole 400mg BID → Intrathecal Amphotericin + Posaconazole 400mg BID

Case 3: Liposomal Amphotericin → Fluconazole 1000mg daily

CONCLUSION

Incident of intraparenchymal Coccidioidomycosis is low. The diagnosis should be considered in cases with encephalitis or presence of focal neurological symptoms. There is no definitive treatment.

REFERENCE

Banuelos, A. F., Williamns, P. L., Johnson, R. H., Fredricks, D. N., Gilroy, S. A., Bhatti, S. U., Stevens, D. A. (1996). Central Nervous System Abscesses Due to Coccidioides Species. Clinical Infectious Disease, 22(240), 50th ser., 240-250.

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