

INVASIVE FUNGAL VASCULOPATHY AND CENTRAL NERVOUS SYSTEM COMPLICATIONS

Neurology

Dr. Moses .P. Moorthy*

The Tamilnadu Dr.mgr Medical University, Coimbatore Medical College, India.
*Corresponding Author

Prof Av.srinivasan

The Tamilnadu Dr.mgr Medical University, Coimbatore Medical College, India .

Dr.k.prasanthi

The Tamilnadu Dr.mgr Medical University, Coimbatore Medical College, India .

KEYWORDS

60 years female admitted with subacute onset of pain left side of face , swelling around left eye , drooping of left eyelid , loss of vision in left eye of 3 days duration . After admission in the hospital course she developed weakness of right upper and lower limb , congestion and proptosis of left eye. She was having diabetes for the past three years, poorly controlled. Random blood sugar was 450mg/dl and urine acetone was positive. During the hospital course she developed diabetic ketoacidosis for which she was treated. ENT and Ophthalmology opinion was obtained as left orbital apex syndrome.

General Examination . Patient was conscious , febrile, BP 110/70 mm hg, PR 110/min , RR 16/min , Spo2 97% with room air.

On CNS examination patient was conscious , Visual acuity on right side – 20/70, left side- no perception of light, absent direct and indirect light reflex on left side , ptosis with complete ophthalmoplegia on left side. On motor examination power of 1/5 both upper limb and lower limb on right side with deep tendon reflexes brisk on right side with plantar extensor on right side.

Lab investigations. Total count was 12,900 , ESR 52 mm/hr , peripheral smear – neutrophilic leukocytosis with mild thrombocytosis. Other routine blood investigations were normal.

NEUROIMAGING

Showed acute infarct in left parietal cortex, centrum semiovale, corona radiata capsuloganglionic region, post watershed region. Small vessel ischemic changes. Non visualized intracranial portion of left internal carotid artery with complete reformation of left anterior cerebral artery , left middle cerebral artery through circle of Willis. Left cavernous sinus thrombosis. Left ethmoid and sphenoid sinusitis with possible erosion of sphenoid sinus (Fungal etiology).

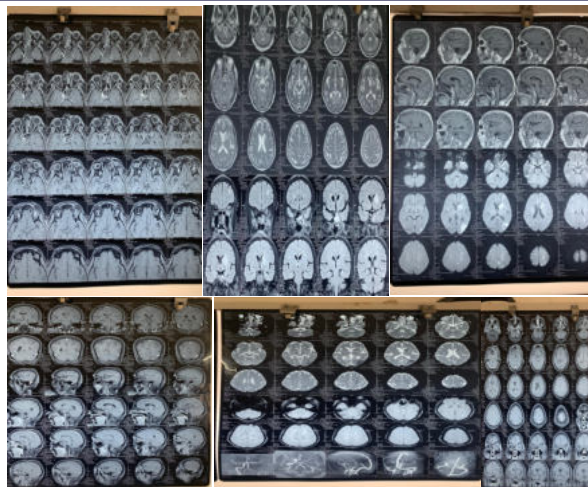
DIAGNOSIS

Patient was diagnosed to be having invasive fungal vasculopathy associated with multiple central nervous system complications including ischemic stroke with right side hemiparesis with multiple infarcts in left middle cerebral artery territory secondary to left internal carotid artery occlusion ,cavernous sinus thrombosis, orbital apex syndrome with complete vision loss in left eye , invasive fungal sinusitis.

TREATMENT

Patient was treated with intravenous amphotericin B , Vancomycin , Ceftriaxone and supportive treatment.

MRI BRAIN WITH MRAMRV
INVASIVE FUNGAL VASCULOPATHY.
CAVERNOUS SINUS THROMBOSIS
ORBITAL APEX SYNDROME
LEFT INTERNAL CAROTID ARTERY OCCLUSION
MULTIPLE INFARCTS IN LEFT MIDDLE CEREBRAL ARTERY TERRITORY
SPHENOID SINUSITIS



DISCUSSION

Infection is the invasion of an organisms body tissue by disease causing agents, their multiplication and reaction of the host tissue to infectious agents and the toxins they produce. Infections are caused by infectious agents including bacteria , viruses, fungi, prions, parasites and arthropods. There are five main causes of infections of central nervous system includes bacterial, viral, fungal , protozoal and prions.

Stroke is a medical condition in which poor blood flow to the brain causes cell death. Infectious causes of stroke includes bacterial infections such as syphilis, tuberculosis, bacterial meningitis. Viral infections include varicella zoster virus , HIV infection. Fungal infections include yeast, molds, dimorphic fungi. Central nervous system ischemic events caused by fungal infections are rare and clinical characteristics of this ischemic events are largely unknown. Among fungal pathogens aspergillus is most likely to present as stroke or stroke like syndrome. Pathologically there are multiple areas of cerebral infarction with thrombosis due to aspergillus invasion of arteries. Like aspergillus, mucor species are angioinvasive and can cause stroke through bland infarction and vascular thrombosis .Ischemic stroke secondary to central nervous system fungal infections should be considered in patients with recurrent or progressive cryptogenic stroke .(1,2,3,4)

Orbital apex syndrome is a collection of cranial nerve deficits associated with a mass lesion near the apex of the orbit of the eye. The most common finding is oculomotor dysfunction leading to ophthalmoplegia accompanied by ophthalmic nerve dysfunction leading to hypoesthesia of the upper face and optic nerve involvement resulting in visual loss. Invasive aspergillosis associated with orbital apex syndrome has been reported.(4)

Fungal infection spreading from the paranasal sinus to the cavernous sinus and orbital apex is a rare and potentially life threatening disease. In our experience aspergillus infections usually invade the cavernous sinus or orbital apex, but rarely both.(5)

Cavernous sinus thrombosis is a rare life threatening disorder that can

complicate facial infection, sinusitis, orbital cellulitis, pharyngitis or otitis or following traumatic injury or surgery. Fungal infections in cavernous sinus thrombosis is less common but can include aspergillosis, zygomycosis, coccidiomycosis in immuno compromised patients.(5,7)

Immunocompromised patients are more prone for intracranial invasive fungal infections. Cases of internal carotid artery occlusion due to invasion of cavernous sinus by intracranial fungal infection has been reported.(5)

Cerebral vascular lesions are frequently observed in rhinocerebral aspergillosis and mucormycosis and coccidiomycosis, more rarely in neuromeningeal cryptococcosis and histoplasmosis. Amphotericin B and flucytosine are used to initiate treatment for central nervous system yeast infections caused by *Candida* and *Cryptococcus neoformans*. Voriconazole is preferred for aspergillus although amphotericin B, particularly in lipid formulation is also useful.(6)

This patient had neuroimaging evidence of fungal sinusitis with invasive vasculopathy, orbital apex syndrome, cavernous sinus thrombosis and ischemic stroke with multiple infarcts secondary to left internal carotid artery occlusion.

Patient had clinical features of orbital apex syndrome, left middle cerebral artery territory multiple ischemic stroke, cavernous sinus thrombosis and fungal sinusitis in the background of poorly controlled type 2 diabetes mellitus. Since invasive fungal vasculopathy is rapidly progressive associated with fatal outcome, early diagnosis and appropriate therapeutic intervention is utmost importance.

CONCLUSION

Invasive fungal vasculopathy is associated with multiple central nervous system complications. Early diagnosis and therapeutic intervention is needed to avoid poor outcome.

REFERENCES

- 1 Infectious causes of stroke Jennifer E. Fugate et al. Practical Neurology.
- 2 Central nervous system fungal infection – related stroke . A descriptive study of mold and yeast associated ischemic stroke . Pravin George et al . J Stroke cerebrovascular disease 2020 June.
- 3 Stroke due to fungal infections by Daniel B.Hier , Louis R. Caplan , Cambridge university, DOI: <https://doi.org/10.1017/CBO9780511544897.009>.
- 4 Occlusion of internal carotid artery due to intracranial fungal infection , Joo Pyung Kim et al, Journal of Korean neurosurgical society.
- 5 Fungal infections of central nervous system, Jose gavito- higuera et al, Journal of clinical imaging science.
- 6 Fungal infections of the central nervous system. Treatment strategies for immunocompromised patients, Katharine E Black et al , CNS drugs 2007, 21(4) 293-318.
- 7 Cavernous sinus thrombosis, Michael C. Plewa et al, February 3, 2021, Cleveland clinic foundation.