

CASE REPORTS

Contralateral stroke with rapid recovery in a patient of herpes zoster ophthalmicus

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Abstract

Herpes zoster ophthalmicus commonly presents with vesicular eruptions of skin along a dermatome and post herpetic neuralgia. Viral invasion into the intracranial vessel and resultant arteritis is rare complication, reported mainly in elderly, children and immunocompromised individuals. We report a young immunocompetent male who reported to us with acute right sided hemiparesis following an episode of left sided herpes zoster ophthalmicus three months prior to stroke. Patient had a near complete recovery of his weakness without any treatment with persistent mild dysarthria. Magnetic resonance imaging of brain showed subacute infarct in left middle cerebral artery territory. Magnetic resonance angiogram demonstrated marked narrowing of the proximal segment of left middle cerebral artery. This case highlights herpes zoster ophthalmicus as one of the causes of stroke in young with good prognosis.

INTRODUCTION

Herpes zoster ophthalmicus results from reactivation of the previously acquired varicella zoster virus (VZV) in childhood. The virus lies dormant in trigeminal ganglion and during reactivation it spreads along the ophthalmic division of trigeminal nerve to give rise to herpes zoster ophthalmicus. The incidence of herpes zoster (shingles) is around 1.3 to 1.6 per 1000 people per year.¹ The most common presentation of herpes zoster is the characteristic vesicular eruptions in dermatomal distribution. The most common complications of Herpes Zoster ophthalmicus are local in nature in the form of post herpetic neuralgia, scar and ocular diseases. However, reactivation of varicella zoster can be associated with a variety of systemic complications such as granulomatous angiitis of central nervous system, cerebellitis, myelopathy, retinal necrosis and peripheral vascular disorders. Although VZV vasculopathy is a well documented cause of stroke after herpes zoster attack, it does not fully explain the unexpectedly high risk of stroke observed among these patients. A majority of previous reports show that contralateral hemiplegia is the most common manifestation of VZV vasculopathy resulting in stroke, particularly after herpes zoster ophthalmicus.^{2,3} The majority of reported patients of herpes zoster vasculopathy

were depicted through case reports and guidelines about treatment, and outcome are not clearly mentioned in the literature. The association of HZO and stroke may be overlooked as this complication typically occurs a few months after the original episode. We report a young male who developed right sided hemiparesis with rapid recovery preceded by herpes zoster ophthalmicus on left side.

CASE REPORT

A 25 year old male presented with acute onset right sided hemiparesis with slurring of speech one month earlier. Weakness improved over next one month but slurring persisted. At the time of presentation in our hospital, there was no demonstrable weakness on examination. Mild spastic dysarthria was present. Physical examination revealed presence of a typical hyperpigmented healed scar along the distribution of ophthalmic division of trigeminal nerve along with keratitis of left eye (Figure 1). The patient gave a history of painful vesicular eruptions over left side of forehead and nose (herpes zoster ophthalmicus) three months prior to the development of hemiparesis. The patient did not have any vascular risk factors and was a non-smoker, non-hypertensive and non-diabetic. Enzyme linked immunosorbent

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Figure 1. Photograph of the patient revealing hyperpigmented scar of healed herpes zoster ophthalmicus on left side along with congestion of left eye due to keratitis.

assay for human immunodeficiency virus was negative and the patient was not on any immunosuppressive drugs. His cardiovascular examination was normal and no bruit was heard over the carotid arteries. All his investigations, including erythrocyte sedimentation rate, lipid profile, electrocardiogram, carotid Doppler and echocardiography of heart showed normal

results. Vasculitic markers including antinuclear antibody, rheumatoid factor and antiphospholipid antibodies were non-reactive. Prothrombotic factors assessment including Protein C, Protein S and serum homocysteine revealed normal findings. Magnetic resonance imaging of brain showed subacute infarct in left middle cerebral artery territory (Figure 2). Magnetic resonance

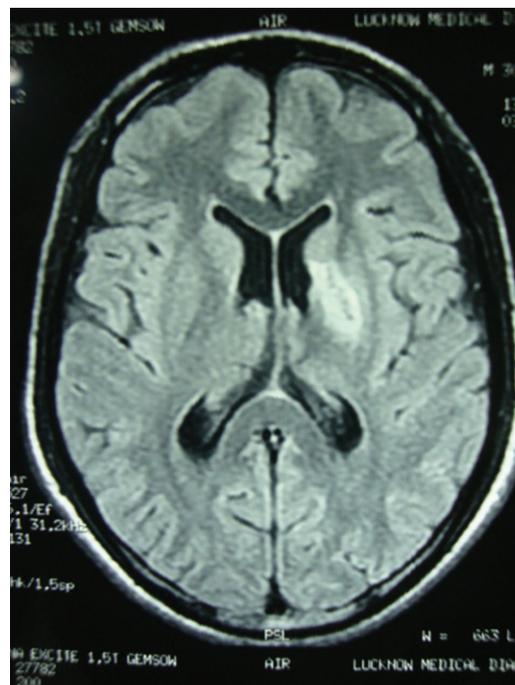


Figure 2. Magnetic resonance imaging of cranium on T2 FLAIR image showing left middle cerebral artery infarct



Figure 3. Magnetic resonance angiogram exhibiting marked narrowing of proximal segment of left middle cerebral artery.

angiogram showed narrowing of the proximal portion of the left middle cerebral artery (Figure 3). Cerebrospinal fluid analysis revealed normal opening pressure with total cell count of 65/microlitre (85% lymphocytes), proteins 57.5mg% and glucose 60 mg% (corresponding blood glucose 110 mg%). Gram staining, acid fast bacilli and Indian ink staining for fungi were negative in cerebrospinal fluid. Cerebrospinal fluid varicella zoster virus DNA detection by polymerase chain reaction was negative. The antibody (IgG) against varicella zoster virus was positive both in CSF and serum. The diagnosis of herpes zoster induced stroke was considered. Although the patient had minimal deficits when he was hospitalized, we instituted intravenous acyclovir therapy (10 mg/kg body weight three times a day) for 14 days due to established herpes zoster etiology. Patient did remarkably well and at follow up after a month had almost complete recovery.

DISCUSSION

The cardinal features of VZV vasculopathy are history of recent infection of herpes zoster, neurological deficits, neuroimaging abnormalities including cerebral ischemia, infarction or hemorrhage, angiographic findings of narrowing or beading in cerebral vasculature and cerebrospinal

fluid pleocytosis.⁴ Unifocal vasculopathy follows ophthalmic distribution zoster in elderly adults or childhood chickenpox and commonly affects large arteries of the anterior or posterior circulation whereas multifocal vasculopathy usually affects branches of large or small cerebral arteries, mostly in immunocompromised individuals.⁴

Our patient was a young, immunocompetent individual who developed unifocal vasculopathy involving large vessel of anterior circulation following an attack of herpes zoster ophthalmicus. Despite being a well-recognized disease entity, VZV vasculopathy is viewed as an uncommon occurrence. However it is possible that vasculopathy is underdiagnosed.⁵ The diagnosis of VZV vasculopathy is not straightforward since (a) neurologic symptoms often develop weeks and sometimes months (average interval 4.1 months) after herpes zoster, so that a transient ischaemic attack or stroke is often attributed to atherosclerotic disease rather than a viral infection in cerebral arteries; (b) not all patients with pathologically and virologically verified disease have a history of zoster rash or chickenpox; and (c) vasculopathies of other etiologies produce the same neurologic symptoms, signs, and cerebrospinal fluid and imaging abnormalities.

In a recent review of 30 patients with virologically verified VZV vasculopathy, 40% of

the patients had no history of zoster or varicella rash.⁴ Thus VZV should be considered as a possible cause of stroke in children and young adults even without a history of rash. Various pathogenic mechanisms of stroke following herpes zoster have been proposed.⁶ First and foremost being vasculopathy produced by invasion of varicella zoster in cerebral vessels. Secondly, mild damage in the vessel produced by VZV initiates secondary atherosclerosis leading to delayed onset of stroke. Thirdly, patients often experience postherpetic neuralgia after a herpes zoster attack. Chronic pain may be associated with elevated sympathetic drive and adverse emotional reactions, theoretically increasing cerebrovascular risks.^{7,8} Fourthly, it is generally accepted that persons who experience stressful events and medical conditions may be associated with the herpes zoster reactivation and attack.

Although stroke has been reported most commonly after herpes zoster ophthalmicus, some authors have reported a relationship between VZV vasculopathy and stroke developing when shingles involved distant dermatomes such as cervical, thoracic, and even sacral regions.⁶ While a recent study showed an increased stroke rate after herpes zoster attack (not limiting to herpes zoster in the ophthalmic distribution), it did not address the effect of antiviral treatments on the stroke rate.⁶ In view of the increased stroke development risk after a herpes zoster ophthalmicus attack, it is of clinical significance to know if antiviral treatment can decrease the rate of stroke incidence.

In a case report of young male developing left sided hemiplegia, due to right middle cerebral artery occlusion following right herpes zoster ophthalmicus, good recovery was shown within a month after intravenous acyclovir therapy for fourteen days.⁹ However in a recent population based study, there was no significant difference in the rate of stroke events following an herpes zoster ophthalmicus attack between patients who received systemic antiviral drugs and those who did not.¹⁰ Despite the lack of definite evidence patients are often treated with intravenous acyclovir based on Category 3 evidence (opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees).³

In conclusion, VZV vasculopathy following herpes zoster is an important cause of stroke, especially in young individuals. Clinical diagnosis is usually based on a history of recent zoster followed by neurologic symptoms and signs; imaging abnormalities indicating cerebral

ischemia, infarction, or hemorrhage; angiographic evidence of narrowing or beading in cerebral arteries; and a CSF pleocytosis. In young stroke patients, herpes zoster infection should be considered even without a history of rash. Immunocompetent patients who suffer from stroke after an attack of herpes zoster ophthalmicus have relatively good prognosis.

DISCLOSURE

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REFERENCES

1. Bowsher D. The lifetime occurrence of herpes zoster and prevalence of post-herpetic neuralgia: a retrospective survey in an elderly population. *Eur J Pain* 1999; 3:335-42.
2. Gilbert GJ. Herpes zoster ophthalmicus and delayed contralateral hemiparesis. Relationship of the syndrome to central nervous system granulomatous angiitis. *JAMA* 1974; 229:302-4.
3. Hilt DC, Buchholz D, Krumholz A, Weiss H, Wolinsky J. Herpes zoster ophthalmicus and delayed contralateral hemiparesis caused by cerebral angiitis: diagnosis and management approaches. *Ann Neurol* 1983; 14:543-53.
4. Nagel MA, Cohrs RJ, Mahalingam R, et al. The varicella zoster virus vasculopathies: Clinical, CSF, imaging, and virologic features. *Neurology* 2008; 70:853-60.
5. Daniel HC, Narewska J, Serpell M, Hoggart B, Johnson R, Rice AS. Comparison of psychological and physical function in neuropathic pain and nociceptive pain: implications for cognitive behavioral pain management programs. *Eur J Pain* 2008; 12:731-41.
6. Kang JH, Ho JD, Chen YH, Lin HC. Increased risk of stroke after a herpes zoster attack: A population-based study. *Stroke* 2009; 40:3443-8.
7. Feller L, Jadwat Y, Bouckaert M. Herpes zoster post-herpetic neuralgia. *Journal of the South African Dental Association* 2005; 60:432, 436-7.
8. Daniel HC, Narewska J, Serpell M, Hoggart B, Johnson R, Rice AS. Comparison of psychological and physical function in neuropathic pain and nociceptive pain: implications for cognitive behavioral pain management programs. *Eur J Pain* 2008; 12:731-41.
9. Kalita J, Das M, Misra UK. Herpes zoster ophthalmicus leading to middle cerebral artery infarction : A case report. *International Journal of Angiology* 2004 ; 13 :51-3.
10. Lin HC, Chien CW, Ho JD. Herpes zoster ophthalmicus and the risk of stroke : A population-based follow-up study. *Neurology* 2010; 74:792-7.