

## Case Report

# Stroke After Multiple Bee Sting

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### Abstract

Bee stings are commonly encountered worldwide. Various manifestations after bee sting have been described.<sup>1</sup> Local reactions are common. Unusually, manifestations like vomiting, diarrhea, dyspnea, generalized edema, acute renal failure, hypotension and collapse may occur. Rarely vasculitis, serum sickness, neuritis and encephalitis have been described which generally develop days to weeks after a sting.<sup>2-7</sup> We report a case of a 25-year-old male who developed left sided monoparesis and transient visual loss following multiple bee stings. Unlike the previous case reports, in our case there has been involvement of both the anterior circulation and posterior circulation territory to the brain. We report this case due to its rarity.

### Introduction

Despite the common occurrence of insect stings and local and systemic allergic reactions,<sup>1</sup> there are few reports of stroke following bee or wasp stings. We report on a young man who sustained a stroke after multiple bee stings.

### Case

25 year old male working in electric motor workshop was bitten by multiple bees over head and neck region in afternoon. He was treated with intravenous antihistamines and antiemetics at a local district hospital in kancheepuram and was discharged as out-patient. Patient woke up the next day morning and found that he was having left upper limb weakness and with blurring of vision. He was then referred to government general hospital. Past medical and surgical history were insignificant. Physical examination revealed left upper limb weakness with a power of 2/5. Fundus examination was done which revealed a normal fundus on both sides. CT brain was immediately taken



Fig. 1 : CT-brain of the patient taken immediately demonstrating right parieto-temporal infarct and bilateral occipital infarct

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which revealed right frontal hypodensities with squashing of ipsilateral ventricles with hypodensities over both occipital lobes (Figure 1). MRI brain was obtained which revealed anterior infarct –right frontoparietal region, right occipital region, right gangliocapsular region with mild luminal narrowing of middle cerebral artery with haemorrhagic transformation (Figure 2). Carotid and vertebral Doppler was also done which was within normal limits. ECG and echocardiography were normal. Patient's serum homocysteine, lupus anticoagulant and anticardiolipin antibodies were within normal limits. Patient was treated with antioedema measures, antiplatelet drugs and physiotherapy. His left upper limb monoparesis gradually improved and patient was discharged from the hospital. Patient's visual acuity also improved. Patient was reevaluated 8 months after the incident. His left upper limb monoparesis had completely recovered. CT-Brain was again repeated 8 months later which revealed old infarct with gliotic changes in right high parietal and occipital region (Figure 3).

### Discussion

In literature review, we had few cases of cerebral infarction occurring after bee sting. Maltzman, *et al*<sup>2</sup> described common characteristics, such as acute to subacute onset of symptoms, moderate to severe visual loss followed by significant recovery (except in one case of a sting directly to the eye) which resulted in oedematous and haemorrhagic optic discs, and central or caecocentral scotomas. Our patient had transient subacute

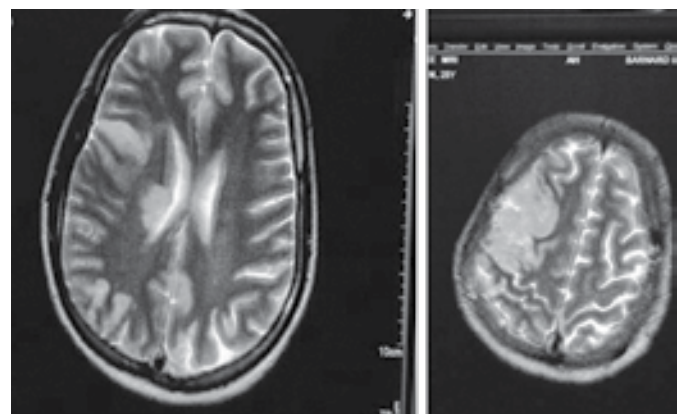


Fig. 2 : MRI –brain taken next day, demonstrating right parietal and right gangliocapsular infarct

**Table 1 : Case reports of neurological manifestations after bee/wasp sting**

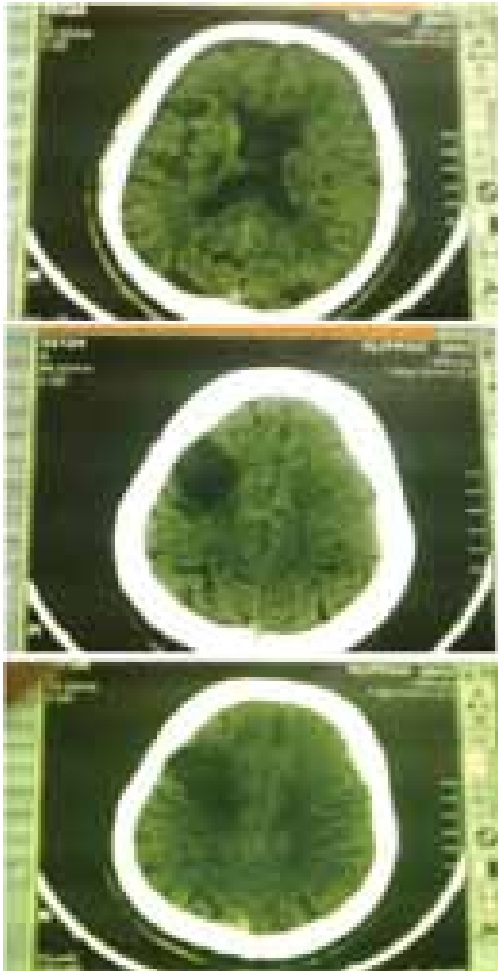
Author/ Reference	Age/ Sex	Type of stings: location	Onset of neurological deficit	Examination findings and symptoms	Eye examination	MRI/CT findings	Treatment	Recovery
Day <sup>3</sup>	36/M	Wasp: multiple on neck, face, and arms	<1 hour	Headache, seizure, right hemiplegia, coma	Equal and reactive pupils	NR; necropsy showed left haemorrhagic cortical infarct	Cortisone, antihistamines phenobarbital	Deceased
Crawley et al <sup>4</sup>	30/F	Wasp: left arm	<1 hour	Facial and arm swelling, widespread urticaria, acute pulmonary oedema, visual loss.	Right homonymous superior quadrantanopia	Left occipital ischaemic infarct	SQ adrenaline, IV gelofusine, IV hydrocortisone, IM chlorpheniramine, IV furosemide	Full recovery from quadrantanopia
Riggs et al <sup>5</sup>	38/M	Wasp: multiple on left face and neck	2 days	Right hemiplegia, dense global aphasia	NR	Ischaemic infarction in the distribution of the left MCA; angiogram: left ICA occlusion	NR	NR
Riggs et al <sup>6</sup>	52/M	Wasp: single, location NR (previous history of wasp sting allergy)	A few hours, with worsening 24 days later	Anaphylactic shock with respiratory arrest, slurred speech and left hemiparesis initially, then 24 days later, acute obtundation and quadriparesis	NR	Initially, three small IV focal ischaemic infarcts, two in the right centrum semiovale and one in the right temporal lobe. After worsening, diffuse bilateral ischaemic white matter lesions.	IV adrenaline, methylprednisolone, diphenhydramine	NR
Starr and Brasher <sup>7</sup>	37/M	Wasp: 3 stings on arms	<1 hour	Seizure, right hemiplegia	NR	Left cerebral infarction (CT done 14 months later)	Barbiturates, corticosteroids, adrenaline	Partial right hemiplegia, one seizure
Speach et al <sup>8</sup>	30/M	Bee: single, location NR	<1 hour	Decerebrate posturing, extensor plantar reflexes, left hemiparesis, hyporeflexia; after coma, patient had motor apraxia and left sensory neglect.	NR	Normal MRI and CT	IV diphenhydramine, steroids and nebulised $\beta_2$ agonist and anticholinergic medications	Residual ideomotor apraxia
Bhat et al <sup>9</sup>	35/M	Bee: multiple "all over the body"	<1 day	Multiple swellings all over the body, vomiting, dysarthria, tinnitus, vertigo and swaying gait, hypertension, bilateral cerebellar signs, rhabdomyolysis with acute renal (respiratory?) failure.	No papilloedema	Bilateral cerebellar haemorrhagic infarct	Dexamethasone, antihistamines, mannitol, insulin, haemodialysis.	Deceased
Present case report	25/M	Bee sting in back of neck and body	1 day later	Left upper limb monoparesis, blurring of vision.	No papilloedema	MRI Brain-Infarct in right frontoparietal region, right occipital region. CT Brain-Right frontoparietal, right occipital hypodensities	Dexamethasone, antihistamines, mannitol, Aspirin,	Full recovery of monoparesis.

**NR (Not-Reported).**

vision loss associated with left monoparesis. Seven cases of wasp and bee sting associated cerebral infarction were found in the literature.<sup>3-9</sup> Reported neurological complications following bee sting includes seizure, hemiparesis, aphasia, apraxia, dysarthria, ataxia, and coma. None of these patients had a full eye examination, although in one patient<sup>4</sup> a right homonymous superior quadrantanopia was demonstrated (Table 1).

The pathophysiology explaining the associated stroke is unknown. Hypotension caused by anaphylaxis may certainly induce cerebral and optic nerve ischaemia; however, this was not documented in our case. Similar to acute myocardial

infarction after hymenoptera stings, it has been suggested that vasoconstriction secondary to mediators released after the sting, aggravated by exogenous adrenaline, and platelet aggregation also contribute to cerebral ischaemia.<sup>4</sup> Bee venom itself contains histamine, thromboxane, leucotrienes, and other vasoactive and inflammatory mediators. In our patient, we postulate that the systemic immune mediated reaction to the bee sting caused vasoconstriction and a prothrombotic state with subsequent ischaemia leading to stroke. In addition, a neuropharmacological (sympathetic) mechanism of endothelial permeability involving the cerebral vasculature with a concurrent systemic thrombogenic



**Fig. 3 : Repeat CT- brain taken 8 months later reveals old infarct with gliotic changes in right high parietal and occipital region**

or immune response has also been postulated.<sup>5,6</sup>

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## References

1. Ewan PW. ABC of allergies: venom allergy. *BMJ* 1998;316:1365–1368.
2. Maltzman JS, Lee AG, Miller NR. Optic neuropathy occurring after bee and wasp sting. *Ophthalmology* 2000;107:193–195.
3. Day JM. Death due to cerebral infarction after wasp stings. *Arch Neurol* 1962;7:184–186.
4. Crawley F, Schon F, Brown MM. Cerebral infarction: a rare complication of wasp sting. *J Neurol Neurosurg Psychiatry* 1999;66:550–551.
5. Riggs JE, Ketonen LM, Bodensteiner JB, *et al.* Wasp sting-associated cerebral infarction: a role for cerebrovascular sympathetic innervation. *Clin Neuropharmacol* 1993;16:362–365.
6. Riggs JE, Ketonen LM, Wymer JP, *et al.* Acute and delayed cerebral infarction after wasp sting anaphylaxis. *Clin Neuropharmacol* 1994;17:384–388.
7. Starr JC, Brasher GW. Wasp sting anaphylaxis with cerebral infarction. *Ann Allergy* 1977;39:431–433.
8. Speach DP, Wong TM, Cattarin JA, *et al.* Hypoxic brain injury with motor apraxia following an anaphylactic reaction to hymenoptera venom. *Brain Injury* 1998;12:239–244.
9. Bhat R, Bhat KR, Pais R, *et al.* Bilateral haemorrhagic cerebellar infarction following honey bee sting. *J Assoc Physicians India* 2002;50:721–722.