

Neuroimaging: Hummingbird sign, a significant sign

Hummingbird sign is a sign commonly expected in a patient with progressive supranuclear palsy (PSP). In this neuroimaging section, we discuss how it is formed, and the other possible differential diagnosis that also show this sign.

Hummingbird sign is largely considered a sensitive sign significant in the diagnosis of PSP. This is an interesting radiological sign that occurs due to midbrain atrophy. Is hummingbird sign the only radiological feature of PSP? Moreover, is PSP the only diagnosis suggested by the hummingbird sign?

A 68-year-old gentleman presented to the hospital with the complaints of recurrent falls and restricted vision. The patient was found to have tremors, stiffness, axial rigidity and cogwheel rigidity, and restricted up and down gaze. The patient had been previously initiated on syndopa, but showed no significant response to the medicine. Magnetic resonance imaging (MRI) revealed significant midbrain atrophy without pontine atrophy suggestive of the hummingbird sign [Figure 1].

Hummingbird sign is known to differentiate PSP from multiple system atrophy and Parkinson's disease.^[1] With the atrophy of the midbrain (confirmed by midbrain to pons ratio, which is reduced from a normal of 0.24 to 0.12), the preserved pons assumes the shape of the body of the bird and the atrophic midbrain forms the head of the bird with the beak extending towards the optic chiasm. Also known as the Penguin sign or the King Penguin sign, this sign is known to be 99% sensitive for PSP, previously known as Steele–Richardson–Olszewski syndrome.^[2]



Figure 1: Humming bird sign seen in our patient

Other features seen in MRI of a PSP patient are elevated diffusion coefficient in caudate nucleus, putamen, and globus pallidus. MR Parkinsonism index, an abnormal superior profile of the midbrain, and maximal diameter of midbrain in mid-sagittal plane can indicate the correct diagnosis.^[2] One may also see the Mickey Mouse sign in the scans.^[3] In advanced stages, a Squint sign may be seen in patients with PSP due to the development of complete ophthalmoplegia leading to a divergent squint.^[4]

Hummingbird sign may also be seen with normal pressure hydrocephalus^[5] or fragile X-associated tremor/ataxia syndrome.^[6]

Hummingbird sign caused by the midbrain atrophy with normal pons is highly sensitive, however, probably not entirely specific to PSP. However, PSP remains the most frequent diagnosis suggested by the Hummingbird sign.

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Conflicts of interest

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