

## UNILATERAL LOSS OF THE SWALLOW TAIL SIGN IN A PATIENT WITH IDIOPATHIC PARKINSON'S DISEASE

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A 66-year-old man with underlying hypertension and dyslipidemia presented with bilateral hand tremor for one year. He also noticed difficulty in initiating movement and slowness in activities of daily living. On examination, he was noted to have mask-like facies with reduced blinking and monotonous speech. There was presence of resting pill-rolling tremor, bradykinesia, and cogwheel rigidity which was present bilaterally but worse on the left upper limb. Gait assessment revealed difficulty in standing up, shuffling gait with reduced arm swing which was more prominent on the left side, and turning in numbers. No cerebellar signs and supranuclear palsy were present. He admits having progressive memory loss with no hallucinations, but he was unsure of the onset and the duration. Hence a magnetic resonance imaging (MRI) was arranged, in order to rule out the diagnosis of Parkinson-plus syndromes, in this case the possibility of Lewy Body Dementia. The susceptibility weighted imaging (SWI) showed loss of the swallow tail sign on the right side [Figure 1]. The clinical presentation, supplemented by the imaging findings were concluded to be pathognomonic of idiopathic Parkinson's disease (IPD), Hoehn & Yahr stage 2. He was started on levodopa and benserazide twice daily with improvement of symptoms.

The nigrosomes are primary subregions of the substantia nigra where dopaminergic cells are lost in IPD. Within these nigrosomes, maximal cell loss occurs in nigrosome-1; the largest subgroup of nigrosomes. Normally, they appear as a SWI-hyperintense area surrounded by hypointensity within the dorsolateral substantia nigra, akin to a swallow's tail. In one study, poor visualization of nigrosome-1 was significantly associated with higher motor asymmetry in the contralateral side (sensitivity 98.5%, specificity 93.6%, positive-predictive value 98.3%, negative-predictive value 98.3% and an accuracy of 96%) [1]. Noh et al [2] showed that abnormality involving nigrosome-1 can be detected at 3T MR imaging with an accuracy of 94.6%. Liu et al [3] in their study demonstrated the potential application of the absence of the swallow tail sign in determining disease progression in Parkinson's disease, and in the diagnosis of parkinsonism. With regards to the diagnosis of Lewy Body Dementia, an abnormal swallow tail sign has been found to potentially assist in the diagnostic work-up [4]. Due to the difficulty in diagnosis of early stage IPD, a loss of the swallow tail sign serves as a useful imaging biomarker to supplement the clinical diagnosis, as seen in our patient.

## REFERENCES

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## FIGURE LEGENDS

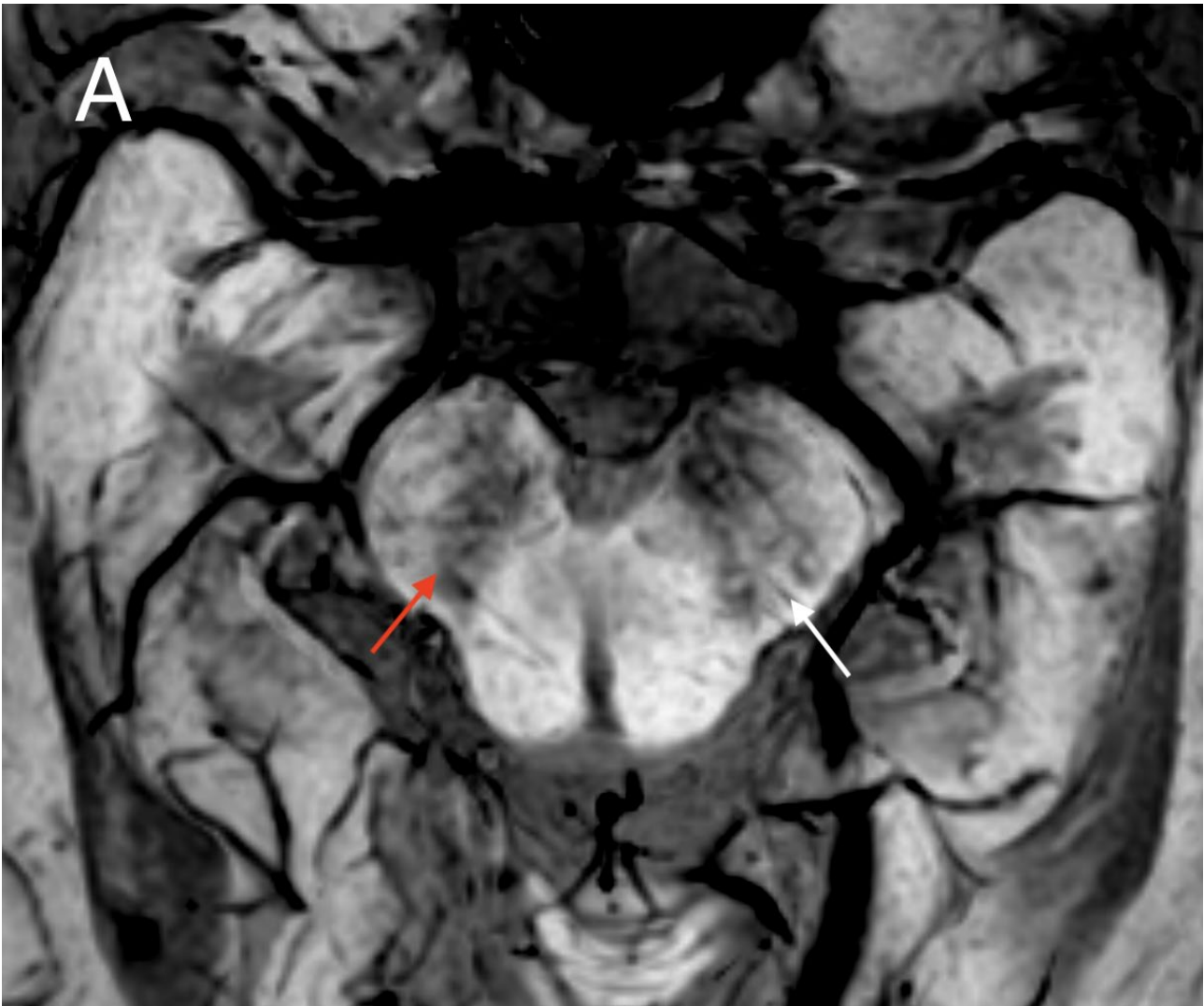
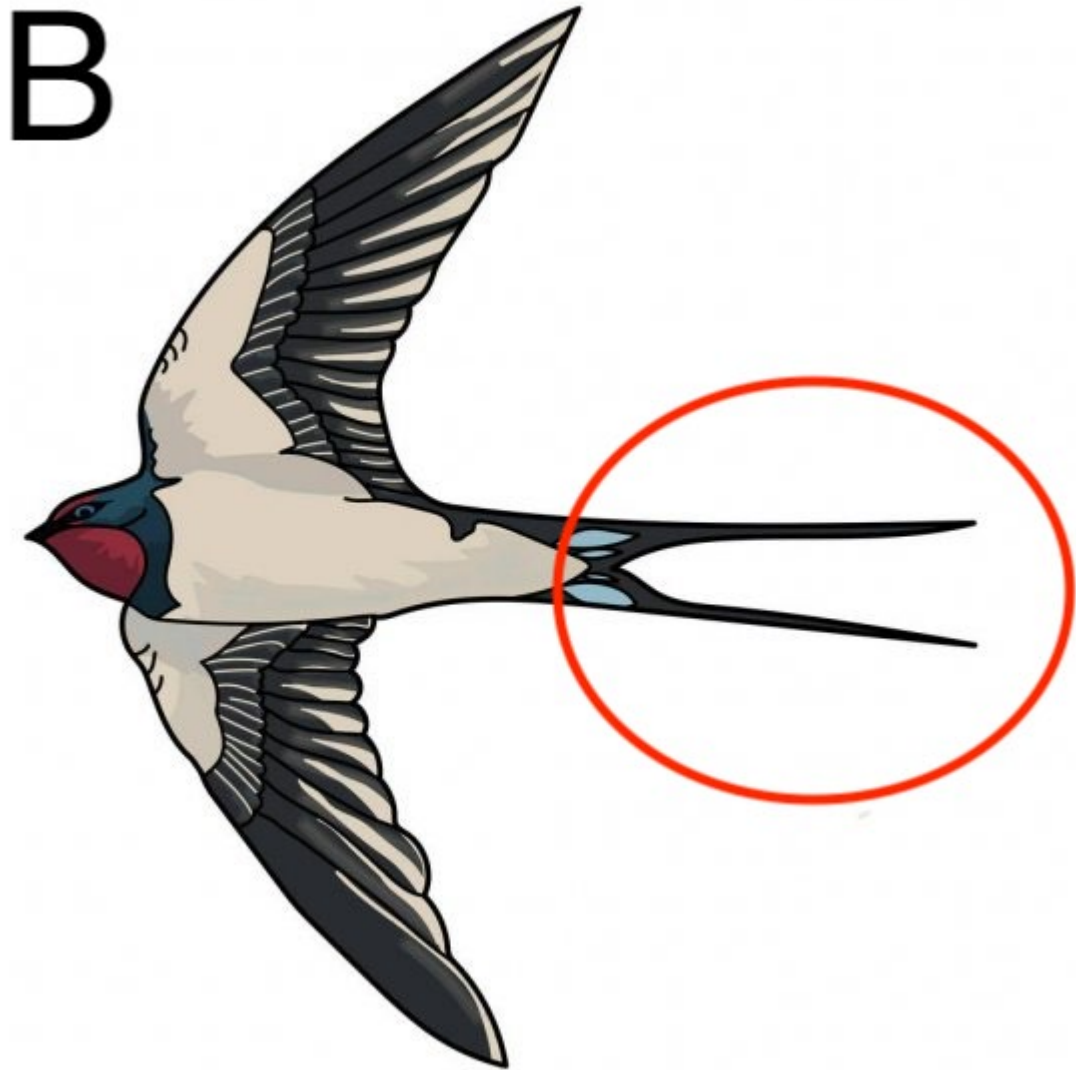
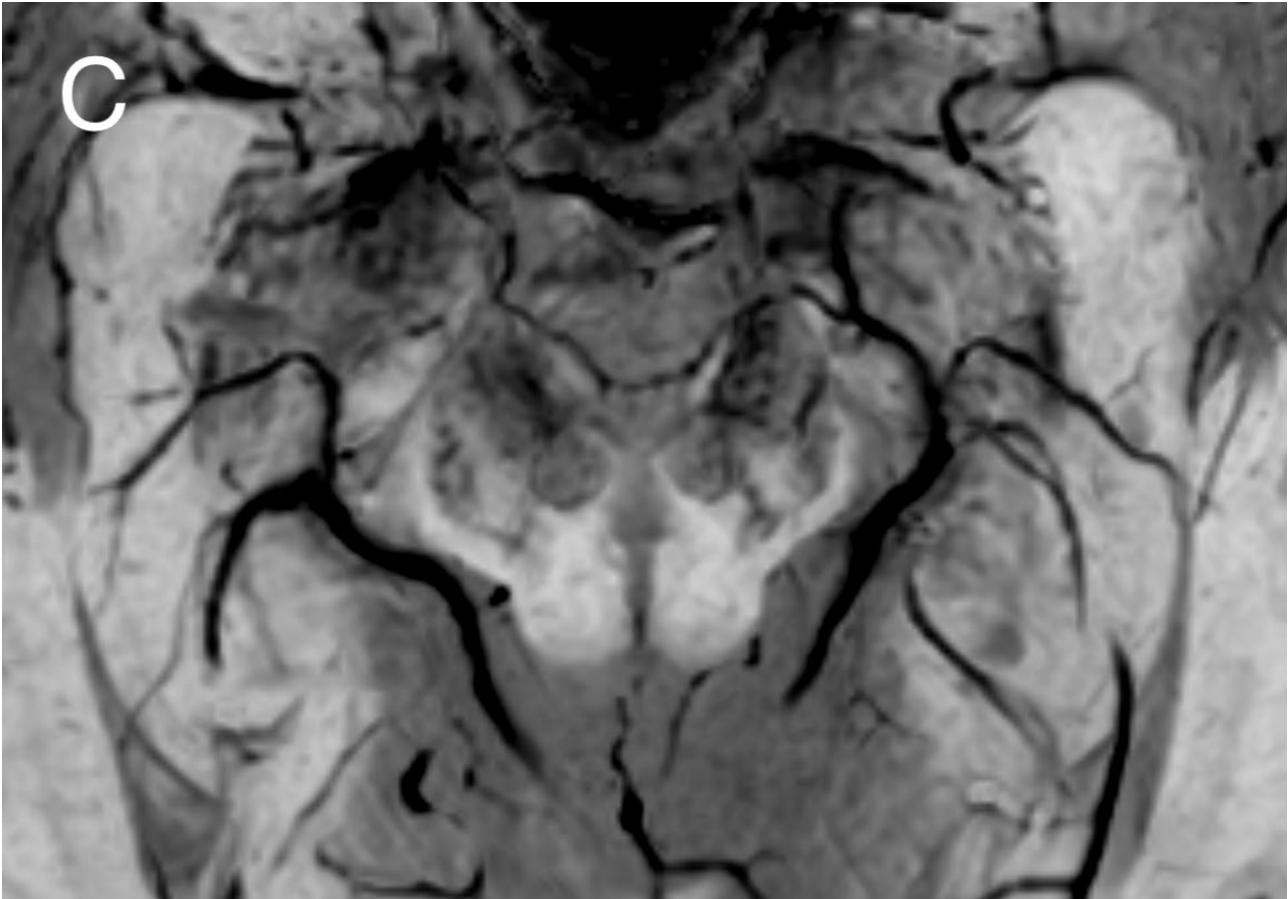


Figure 1  
A – Axial susceptibility weighted imaging (SWI) image at the level of the dorsolateral substantia nigra shows normal swallow tail sign on the left (white arrow), with absence on the contralateral side (red arrow). In normal individuals, normal high SWI signal is seen, surrounded by the hypointensity of the substantia nigra.



B – Pictorial representation of the swallow’s tail (in red circle), from which this imaging sign is derived.



C – Axial susceptibility weighted imaging (SWI) at the level of the dorsolateral substantia nigra (of a normal patient, using the same scanner) shows normal swallow tail sign bilaterally. Note presence of the hyperintense signal (denoting presence of nigrosomes) bilaterally surrounded by the hypointensity of the substantia nigra, as opposed to Figure 1A.