

# Progressive supranuclear palsy

- PSP is also one of the atypical parkinsonian syndromes.
  - Death of brain cells in the substantia nigra, accounts in part for the motor symptoms that PSP and Parkinson's have in common
- In PSP there is pronounced atrophy of the midbrain (mesencephalon)
- Normally the upper border of the midbrain is convex. Typical upward gaze paralysis.
- The atrophy of the midbrain in PSP results in a concave upper border of the midbrain with the typical '**humming bird sign**'

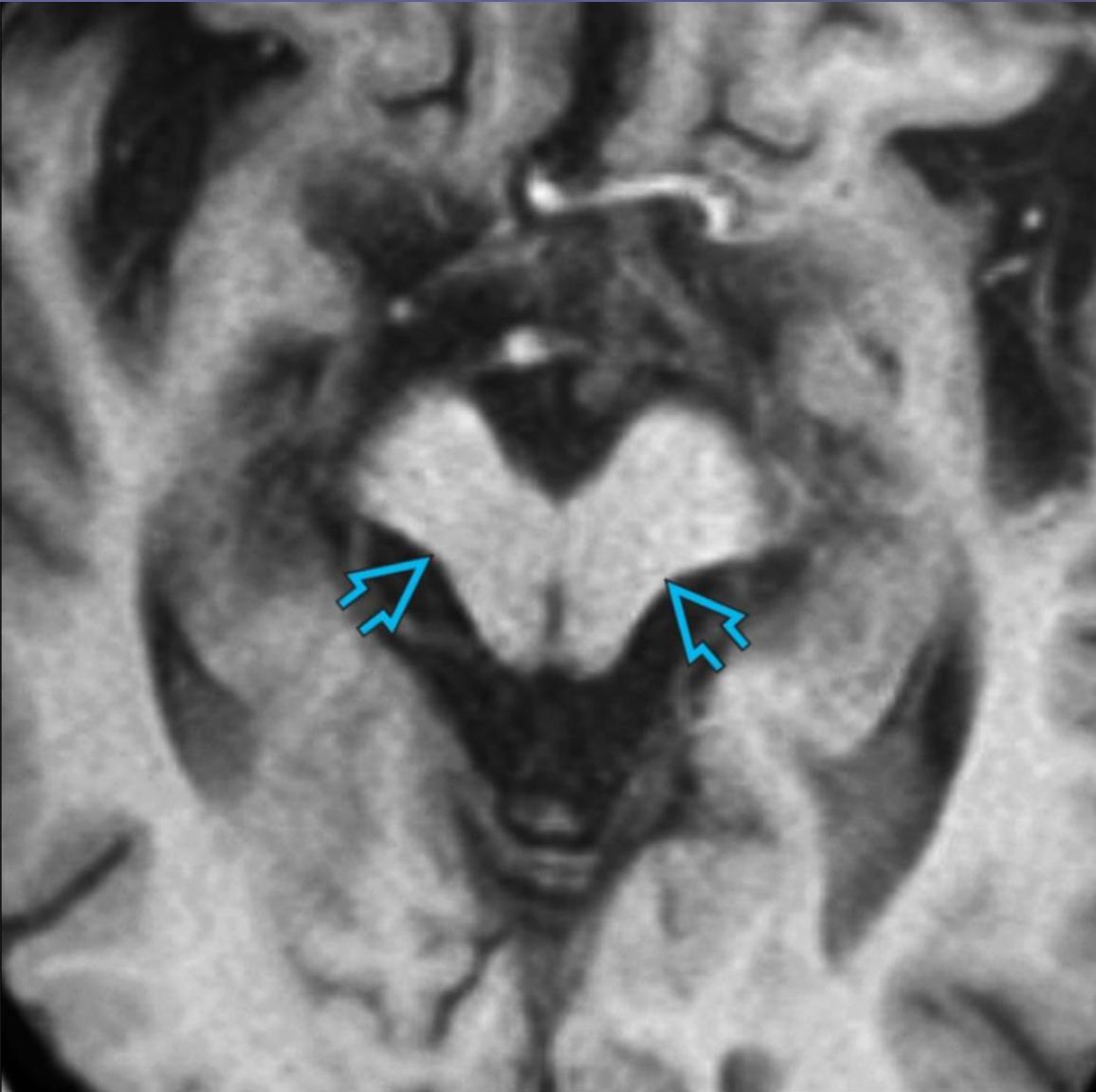
# PSP

- Typically begins in a person's mid- to late-60s, later than when Parkinson's disease symptoms typically develop.
- Slow eye movements
- Trouble looking up or down
- Trouble controlling eyelids, involuntary closing of the eyes, decreased blinking, or difficulty opening the eyes
- Tendency to move the head rather than just the eyes to look in different directions



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Midline sagittal T1WI of 65-year-old man with progressive supranuclear palsy shows asymmetric atrophy of the midbrain. Slight concave appearance of the superior surface of the midbrain → (penguin or hummingbird sign) and atrophy of the superior colliculus ↗ is shown.

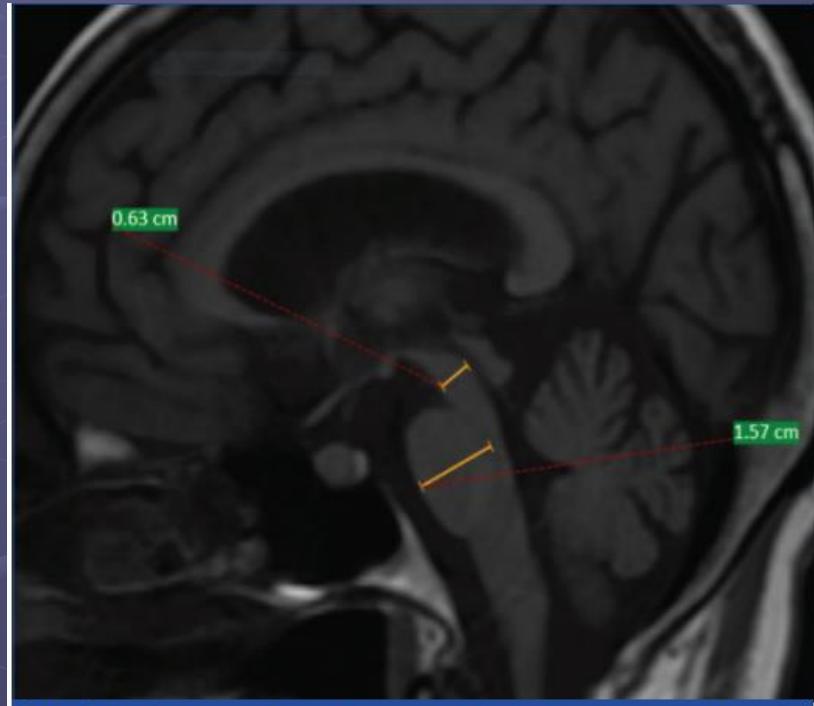


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Axial T1WI in the same patient shows concave appearance of lateral surface of midbrain ➡ (morning glory or Mickey Mouse sign) due to atrophy.

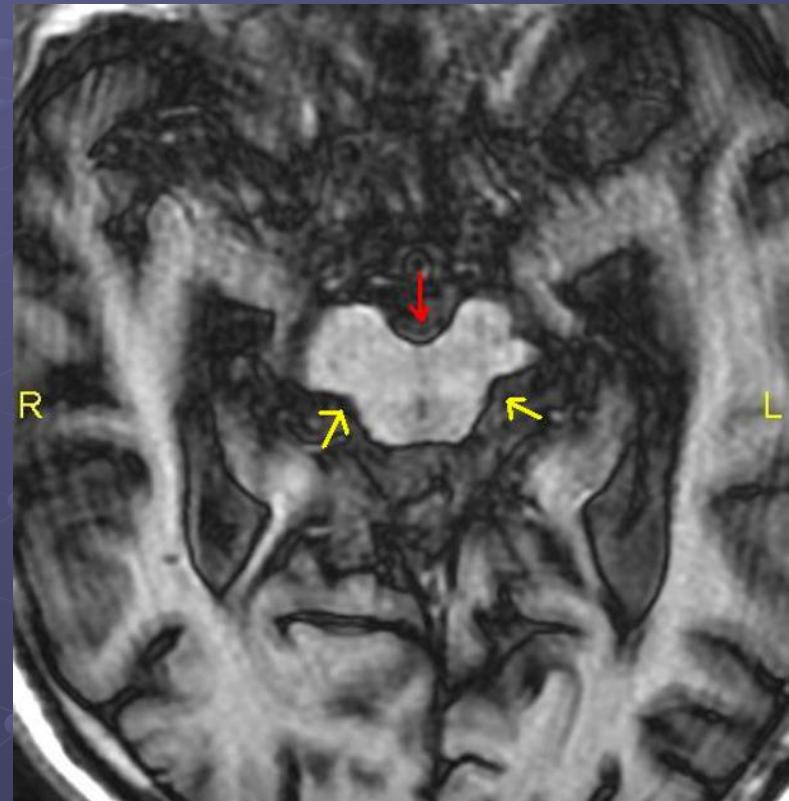
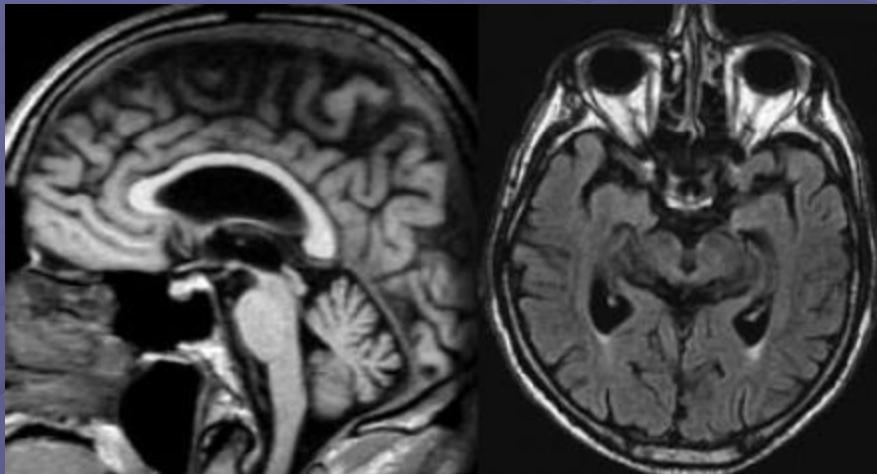
# Measurements

- Massey LA et al., proposed that midbrain diameter of **less than 9.35 mm** is **100%** specific for the diagnosis of PSP.
- Using a threshold **midbrain-to-pons ratio** of **0.52** was found to be **100% sensitive** and **85.7% specific** in diagnosing PSP with **100% positive predictive value**



[Table/Fig-1]: Demonstration of measurement of midbrain diameter (shorter line) (0.63 cm) and Pontine diameter (1.57 cm) in the patient-(Midbrain pons ratio was 0.40).

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***Mickey mouse appearance:***  
reduction of anteroposterior midline midbrain diameter, at the level of the superior colliculi on axial imaging (from interpeduncular fossa, to the intercollicular groove):