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A 27-year-old male, who had never grown facial hair, collapsed suddenly at work. He gradually recovered after intramuscular caffeine injection. Temperature was 96°F. The tongue was bitten. Pupils were equal and reacted sluggishly to light. There was horizontal nystagmus. Tendon reflexes were depressed. Kernig's sign was positive. Spinal tap was refused. Serum chloride was 120 MEq./L. Two days later, transitory apathy was noted. Blood pressure was 80/60 and pulse 56/min. Four days thereafter, he suddenly became unconscious and had a systolic blood pressure of 80 mm. Hg. Later there was an episode of projectile vomiting. He was found dead the following day.

General Necropsy Findings: The testes and thyroid were small. The right adrenal gland was small, the left contained a cortical adenoma.

Adjacent to the right adrenal gland was a 4 x 3 x 1 cm. smooth-surfaced para-aortic ganglioneuroblastoma; the tumor was histologically typical and did not resemble the nodules described below.

CNS: At the base of the brain, a smooth, sessile, firm, pale-pink mass mottled with flecks of yellow protruded from the tuber cinereum. After fixation, the focally necrotic tissue was found to infiltrate and destroy parts of the hypothalamus bilaterally. Sixteen similar well demarcated, roughly spheroidal nodules, 0.5 to 1.6 cm. in maximum dimensions, were found widely dispersed in the brain. They could not readily be separated from adjacent tissue. Nodules were found in the cerebral cortex, amygdala, right caudate head, left caudate tail, posterior parts of the right hippocampus, adjacent thalamic pulvinar, left cerebellar cortex and postero-lateral aspect of the right medulla. Other nodules were entirely within cerebral and cerebellar white matter.

The ventricular surfaces were normal. There were no tubers on the cortical surfaces. No abnormality was found in the spinal cord and attached nerve roots. Microscopically, in addition to the nodules, many ectopic neurons were found in white matter.

Microscopic Pathology: Hematoxylin and Eosin stained section plus one unstained slide.

Points for Discussion:

1. Are these nodules neoplastic? *Yes*
2. If not, what are they?
3. If neoplastic, what is their nature? *Glial ... - K...*