A Case of Growth Hormone Producing Pituitary Adenoma with Crystal-Like Structures: Bihormonal Stained Amyloid Deposition

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Abstract

Amyloid deposition may adopt a crystal-like structure in functioning pituitary adenomas. We report a case of growth hormone (GH)-producing pituitary adenoma with crystal-like structures that are positive, by immunohistochemistry, for GH and prolactin (PRL). A 53-year-old Japanese woman presented with change in facial appearance, headache, hypertension, and enlargement of hands and feet. Hormonal analysis showed elevated amounts of GH and insulin-like growth factor-1. A slightly elevated PRL concentration indicated pituitary "stalk effect". Magnetic resonance imaging revealed a mass arising from the pituitary gland. Preoperative diagnosis was acromegaly, and transsphenoidal resection was performed. Histopathologically, neoplastic acidophils and chromophobes were arranged in diffuse arrays with occasional intracytoplasmic fibrous bodies. Between tumor cells we found numerous crystal-like structures (≤40 μm in diameter). The tumor was composed of an admixture of GH-positive cells and focal PRL-positive cells. Congo Red stain and electron microscopy revealed crystal-like amyloid deposits that were GH- and PRL-positive. Clinicopathologically, a diagnosis of sparsely granulated somatotroph adenoma with increased PRL production due to stalk effect was determined. Crystal-like structures showed a heterogenous or bihormonal staining pattern, which might be indicative of bihormonal amyloid formation.

Key words: **Pituitary Adenoma, Growth Hormone, Crystal, Amyloid, Bihormonal**