

Case report:

Neuroendocrine Disturbances as The Initial Manifestation of Leptomeningeal metastasis.

Carlo Arevalo, Joseph Nicholas.

Abstract

Leptomeningeal metastasis (LM) is defined by the presence of malignant cells in the leptomeninges or cerebrospinal fluid (CSF) distant from the site of the tumor. Herein we present a patient with LM associated with neuroendocrine findings as the surprising initial manifestation of breast cancer with important anatomical and physiologic associations.

60 year old female with no significant PMH presented reporting 4-weeks of rapidly progressing symptoms including 20 pounds unintentional weight loss, fatigue, polydipsia, polyuria, and right-gaze diplopia. Patient reported being up-to-date in malignancy screening. Initial blood work was remarkable for anemia (10.3 g/dL), thrombocytopenia (122 thou/uL), and hypercalcemia (12 mg/dL). Additional work up revealed secondary adrenal insufficiency that was treated with steroid replacement therapy that unmasked diabetes insipidus (DI). MRI of the head revealed extensive leptomeningeal enhancement in the basal structures of the brain, specifically in the posterior pituitary gland, the base of the left third nerve, as well as posterior fossa. MRI of the spine also showed extensive enhancement in multiple sites, as well as heterogeneity of the bone marrow. CSF analysis was significant for elevated total protein (185 mg/dL), 13 nucleated cells (94% of lymphocytes), normal glucose levels (60 mg/dL), and negative cytology. Bone biopsy was deemed non-diagnostic, but suspicious for metastatic breast carcinoma. Subsequent mammography suggested a spiculated mass that was positive for invasive lobular carcinoma.

This case illustrates the multifocal involvement of LM that makes this diagnosis very challenging, even more in the absence of known malignancy. Physiological connection between ADH and cortisol was noted in this case when steroid replacement therapy unmasked central DI. Normally, cortisol induces resistance of the V₂ receptor to ADH, so ADH action is amplified in states of steroid deficiency, which is blunted after steroid therapy. Finally, this case taught us that the presence of posterior lobe involvement resulting in central DI should promptly raise suspicion for metastatic disease given its arterial supply and anatomical location that facilitates malignant spreading.