Short term imaging course of drug-induced hypophysitis in a patient with metastatic renal cell carcinoma treated with nivolumab electing to continue therapy

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Case Presentation

A 50-year-old male with a history of metastatic Furham grade 3 clear cell renal cell carcinoma (RCC) status post prior radical unilateral nephrectomy and retroperitoneal mass excision with recurrent disease and new lung metastases presented to the emergency department with sudden onset blurry vision.

He was 2 weeks status post initiation of nivolumab, which was started following intolerance of prior therapy with sorafenib and carbozantinib, for trans-bronchial biopsy confirmed metastatic RCC.

The patient was determined to have bitemporal hemianopsia. He was admitted for neurosurgical evaluation and high dose steroids were administered, resulting in rapid improvement vision.

MRI brain with contrast was obtained demonstrating mildly heterogeneously enhancing suprasellar mass involving the pituitary and infundibulum [Figure 1]. Rapid symptomatic improvement and history of nivolumab use were suggestive of immune checkpoint inhibitor related drug-induced hypophysitis.

However, nivolumab was determined to be the best chemotherapeutic option following a joint decision with the patient. The patient was discharged on a steroid taper with short-term follow-up and plans for serial pituitary MRIs.

Follow-up pituitary protocol MRIs 3 weeks, 3 months, and 6 months after presentation demonstrated stable appearance of the heterogeneously enhancing lesion without change in size or extent.

Figure 1. A. Non-contrast mid-sagittal T1 image from March 2010 through the pituitary showing a normal pituitary. B. Brain MRI from July 2019 after patient developed acute onset visual disturbances and vertigo. Contrast enhanced T1 images through the pituitary show edematous, enhancing pituitary and infundibulum. C. Follow-up Pituitary Protocol MRI from September 2019 after completing a short course of steroids. There is persistent infundibulohypophysitis.

Discussion

Nivolumab is an anti-programmed death 1 (anti-PD-1) monoclonal antibody that is used in the treatment of metastatic melanoma, non-small cell lung cancer, and renal cell carcinoma, often in combination with ipilimumab.

Nivolumab-induced hypophysitis is rare (<1%) and causes endocrinopathies via leukocyte infiltration of the pituitary gland and the resulting mass effect. Imaging findings most commonly include symmetric enlargement and enhancement of the pituitary with variable involvement of the pituitary stalk.

The differential diagnosis for pituitary metastases includes infectious, inflammatory, neoplastic, and vascular pathology. MRI and clinical history can aid in differentiating lesions.

Findings that are concerning for pituitary metastases include additional intracranial metastatic lesions, cavernous extension, size greater than 2 cm, and heterogeneous enhancement.

While surgical intervention or radiotherapy may be needed for pituitary metastases, corticosteroids and cessation of the inciting medication is the best treatment for drug-induced hypophysitis.

Conclusion

Temporal relationship of onset of symptoms to initiation of nivolumab in addition to the stability of the pituitary lesion over the 6 month follow-up period are consistent with drug-induced hypophysitis.

References

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