

decade of life. Main mechanisms involved in the pathogenesis are genetics and autoimmune causes, traumatic brain injury and infarction of the pituitary postpartum, known as Sheehan's syndrome. Sheehan's syndrome is characterized by postpartum hemorrhage, failure to lactate and menstrual irregularities and it can occur from immediate postpartum period to years after delivery. The most common hormone deficiencies are prolactin and growth hormone. Empty sella is the most common finding on brain MRI. We are reporting a case of a woman in her third decade with isolated ACTH deficiency due to Sheehan's syndrome two years postpartum, able to lactate, with normal menses and normal brain MRI. **Clinical Case:** A 33-year-old woman G3P3A0 with hypothyroidism who was referred to Endocrinology clinics due to tiredness, fatigue and weakness. She reported postpartum hemorrhage requiring 4 PRBC transfusions and IV steroids after last pregnancy 5 years ago. Patient was able to lactate after pregnancy and continued in her usual state of health until 3 years ago when she referred loss of consciousness with traumatic head injury due to hypoglycemia. At Endocrinology office physical examination and vital signs were unremarkable, including no blood pressure or heart rate variations with positional changes. Despite hypothyroidism being adequately controlled, she continued with extreme fatigue and weakness affecting her quality of life, for which cortisol and ACTH levels were ordered. Laboratories showed normal electrolytes, negative autoantibodies, cortisol 0.20 µg/dL (5-25 µg/dL) and ACTH 22 pg/mL (10-60 pg/mL) suggesting partial isolated ACTH deficiency. ACTH stimulation test was done and noted with suboptimal response. Evaluation of other anterior pituitary hormones was normal. Brain MRI showed normal pituitary gland. She was started on hydrocortisone in AM and PM and symptoms resolved. **Conclusion:** Immediate recognition of isolated ACTH deficiency due to Sheehan's syndrome is necessary due to the availability of effective treatment and morbidity and mortality associated with this serious condition. To our knowledge isolated ACTH deficiency due to Sheehan's syndrome in which the patient was able to lactate and normal findings on brain MRI has not previously been reported. **References:** Shivaprasad C. Sheehan's Syndrome: Newer advances. Indian J Endocrinol Metab. 2011 Sep; 15(3): S203-207. DOI:10.4103/2230-8210.84869.

Thyroid

THYROID NEOPLASIA AND CANCER

Primary Thyroid Lymphoma Developing from a Background of Lymphocytic Thyroiditis: First Report in Mice

Yoshinori Yasuda, MD, PhD, Fabiana Pani, MD, Patrizio Caturegli, MD, MPH.

Johns Hopkins University School of Medicine, Baltimore, MD, USA.

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Primary thyroid lymphoma is rare, accounting for less than 5% of all thyroid malignancies. It typically develops in patients with Hashimoto thyroiditis who have approximately a 70 fold higher risk than other patients. The mechanisms underlying the development of thyroid lymphoma remain unclear, and no mouse model has been

described. For our studies of papillary thyroid cancer and lymphocytic thyroiditis, we crossed TPO-Cre-ER transgenic mice and hBRAF^{V600E} knock-in mice onto the NOD.H2^{h4} background to establish TPO-Cre-ER_ hBRAF^{V600E} NOD.H2^{h4} strain where papillary thyroid cancer is induced by the injection of tamoxifen and thyroiditis by the administration of iodine in the drinking water. Mice injected with corn oil or drinking regular water served as control. In 3 of 121 mice, TPO-Cre-ER_ hBRAF^{V600E} NOD.H2^{h4} mice injected with corn oil and drinking iodinated water we observed the development of thyroid lymphoma. At about 6 months after the injection of corn oil, these mice developed a marked increase in the size of the thyroid gland, which appeared hypoechoic on thyroid ultrasound. Fine needle aspiration on the thyroid gland under ultrasound was performed, along with measurement of TPO antibodies, H&E thyroid histology, immunohistochemistry, and flow cytometry at the time of sacrifice. Histology established a diagnosis of Hodgkin lymphoma with the typical Reed Sternberg cells. Flow cytometry identified an increased frequency of CD8⁺ effector memory T cells in the thyroid lymphoma. TPO antibodies were significantly higher in mice with thyroid lymphoma than in those without, perhaps suggesting their utility as predictive biomarkers. In summary, we report a mouse model of thyroid lymphoma that evolves from a background of lymphocytic thyroiditis with a predictable natural course that can be monitored by thyroid ultrasound and TPO antibodies. This model can be used to study the mechanisms and development of thyroid lymphoma in patients.

Healthcare Delivery and Education

EXPANDING CLINICAL CONSIDERATIONS FOR PATIENT TESTING AND CARE

Evaluation of the Timeliness of Serial Denosumab Administrations at the University of Colorado Hospital

Adnin Zaman, MD, Sarah J. Billups, PharmD, Micol S. Rothman, MD.

University of Colorado, Aurora, CO, USA.

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BACKGROUND:

Denosumab is an antiresorptive medication commonly used in the treatment of osteoporosis that works by slowing bone loss. This medication should not be delayed or interrupted without initiation of an alternative treatment (i.e. bisphosphonates) as studies have shown that this can lead to rapid bone loss, very high markers of bone turnover, and increased vertebral fracture (VF) risk. It is unknown how frequently dosing is delayed in practice settings and how best practices can ensure timely dosing. Our study aimed to (1) evaluate the frequency and causes of delayed denosumab doses at our institution and (2) compare the incidence of delayed doses before and after implementation of a new electronic ordering process.

METHODS:

We performed a retrospective chart audit for all patients receiving two or more denosumab doses at our institution between 1/1/16-8/11/18 and categorized those whose doses were ≥ 214 days (7 months) as delayed. We reviewed