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## Thyroid

### THYROID CANCER CASE REPORTS

#### *Radioactive Iodine Resistant Papillary Thyroid Cancer “Redifferentiated” With Dabrafenib*

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**Background:** Differentiated thyroid cancers (DTC) make up 95% of all thyroid cancers. Radioactive iodine therapy (RAI Rx) is an integral part of DTC management. However, 5-15% of DTC and 50% of metastatic DTC become resistant to RAI Rx and carries a 10-year survival of only 10%. One of the newer therapeutic options target “redifferentiation” of the tumor using RAI sensitizers, notably with short-term use of tyrosine kinase inhibitors (TKI). **Clinical Case:** A 62-year-old women with a 3-year history of Papillary TC s/p surgery (Sx) and 175 mCi RAI presented to establish care and was found to have bulky palpable disease in her left lateral neck. Imaging showed bilateral enlarged lymph nodes in the neck and multiple bilateral pulmonary nodules. Her stimulated thyroglobulin (TG) level was 5341 (1.59 - 50.03 ng/dL) with negative TG antibodies. Bone scan showed no evidence of bone mets. She underwent repeat neck dissection (49 positive lymph nodes) and was BRAF V600E positive. Post-Sx her non-stimulated (NS) TG was 340 ng/dL (0.00 - 41.00 ng/mL) and she received 200mCi RAI Rx with post-Rx whole body scan (WBS) showed uptake only in the thyroid bed. Imaging 6 months later showed stable lung nodules but increase in lymphadenopathy in the neck and her NS-TG was 181 ng/dL. She received 250 mCi of RAI Rx, 10 months after the first dose. Post Rx WBS again showed uptake only in the neck. Her non-stim TG, 9 months later was still high at 130 ng/dL. Given the discordant imaging and TG findings, functional imaging was done which showed multiple avid lesions in bone and lymph nodes confirming the diagnosis of radioiodine-refractory (RAI-R) DTC. Given BRAF V600E positive status, she received Dabrafenib 150 mg PO BID for 6 weeks followed by RAI 300 mCi. Post-RAI WBS showed extensive uptake in base of skull, sternum, cervical spine and right supraclavicular area. Six months post Dabrafenib and RAI, her NS-TG had come down from 130 to 25.7 ng/dL and imaging showed stable structural disease. Her TG levels and imaging have remained stable over the last 18 months indicating both biochemical and structural response to Dabrafenib. **Conclusion:** The goal of TKIs in redifferentiation of RAI-R DTC is to target specific molecular mechanisms to render the tissue sensitive to RAI. There are several published trials using TKIs for redifferentiation based on the mutation present. Dabrafenib alone and in combination with other TKI’s (Vemurafenib, Trametinib) followed by RAI has shown some response in 60-70% of treated patients with RAI-R tumors. In a study with 10 RAI-R patients with BRAF V600E mutations, dabrafenib used as a radiosensitizer showed RAI uptake in 60%. Three months post Rx, 2 of 6

had a reduction in disease burden while the other 4 had stable disease. Redifferentiation Rx can be successful in slowing disease progression and could be an option in the treatment of RAI-R DTC before initiation of long term TKI Rx.

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### THYROID CANCER CASE REPORTS

#### *Radiofrequency Ablation: A Novel Treatment Option for Neck Recurrence in Medullary Thyroid Carcinoma*

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**Background:** Medullary thyroid carcinoma (MTC) is an aggressive cancer with cervical lymph node metastases typically found at presentation. The recurrence rate after resection is high (~ 50%)(1), and patients often need multiple surgeries. Radiofrequency ablation (RFA) has been used in treatment of recurrent thyroid cancer when surgery is contraindicated or declined by patients in both Asia and Europe (2). We present the first case of an MTC recurrence treated successfully with RFA in North America.

**Clinical Case:** A 43-year-old female with sporadic metastatic MTC, status post total thyroidectomy and multiple neck surgeries, presented with elevated calcitonin level of 630 pg/mL (normal: < 10 pg/mL). Neck ultrasound showed left tracheoesophageal groove mass, measuring 12 mm X 12 mm X 17 mm, consistent with metastatic MTC on cytopathology with calcitonin washout of 16590 pg/mL (normal: < 10 pg/mL). She had no dysphagia, shortness of breath or hoarseness of voice. Computed tomography (CT) scan of chest confirmed presence of mass, in proximity with left recurrent laryngeal nerve. Serial imaging showed rapid enlargement, with concern for impending aerodigestive tract invasion. Surgical intervention had a high risk of vocal cord paralysis due to the lesion’s location. A multidisciplinary tumor board agreed that thermal ablation aimed at shrinking the mass, as a bridge to systemic therapy, would be the best option. RFA was performed as an outpatient with conscious sedation, after informed consent and observing standard aseptic techniques. Under continuous ultrasound guidance, D5W was injected into left tracheoesophageal groove behind the mass and a continuous infusion of D5W at 15 mL/hr was maintained to protect the nerve from thermal injury. Using a trans-isthmus approach, an 18 G monopolar RFA probe with 5 mm active tip was advanced into the malignant mass and ablation was performed with 35 W power until the entire mass was hyperechoic. Vocal response was monitored throughout the procedure and voice remained normal after RFA. A neck ultrasound at her 6 months follow-up showed ablated lesion measuring 7 mm X 11 mm X 10 mm, representing a 68.6% reduction in volume. Repeat CT scan thorax showed disappearance of mass in left neck region.

**Conclusion:** RFA is a minimally invasive and effective treatment for recurrent cervical MTC lesions, and a viable alternative to surgery, as shown in our case. Future studies