Thyroid

THYROID DISORDERS CASE REPORTS IV

Short-Term Outcomes of Radiofrequency Ablation of a Toxic and a Non-Toxic Benign Thyroid Nodule

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Background: Radiofrequency ablation (RFA) of benign thyroid nodules has been shown to be a safe and effective minimally invasive treatment for benign thyroid nodules, based on many years of international experience. Thyroid specific devices have recently become available in the US. Here, we present representative examples of our early experience with RFA for both non-toxic and toxic thyroid nodules in our outpatient center. Clinical Cases: Case 1: A 39 year-old woman presented with subclinical hyperthyroidism, with a TSH of 0.013 uIU/mL (0.45-4.5 uIU/mL). Evaluation showed bilateral autonomously functioning thyroid nodules. Both nodules were predominantly solid with no suspicious features and grade 3 Doppler flow, and were benign (Bethesda II) on UG-FNA. She declined treatment with total thyroidectomy, radioactive iodine, or long-term thionamides, and decided to proceed with RFA, after pre-treatment with methimazole. We decided to target the right lobe nodule first, as it was larger, with a volume of 2.63 ml. The danger triange and vagus nerve were identified, and then we injected local anesthetic using the pericapsular lidocaine technique. We then performed ultrasound-guided RFA of this nodule, using an RF generator with an internally cooled 18-gauge electrode, with a length of 7 cm and an active tip of 7 mm. Power was set at 25 Watts. The trans-isthmic approach and moving shot technique were used. Total energy delivery was 3078 WS. At the end of the procedure, we visualized a transient hyperechoic zone and there was absence of Doppler flow throughout the nodule. She tolerated the procedure well without complications. Methimazole was stopped after the procedure. At the 3-month follow-up, the nodule had decreased in volume by 72.5% and had no internal Doppler flow; TSH normalized (1.37 uIU/mL), so we decided not to proceed with RFA of the left superior toxic adenoma. Case 2: A 49 year-old woman presented with a large right lobe thyroid nodule with a volume of 6.13 ml, which was causing dysphagia and dysphonia. It was predominantly solid with no suspicious features and grade 3 Doppler flow. TSH was normal. It was benign (Bethesda II) on UG-FNA on 2 occasions. She declined surgical therapy, and decided to proceed with RFA. We performed local anesthesia and then RFA in a similar fashion to case 1, with a power of 20-40 Watts. Total energy delivery was 11,491 WS. There were no complications. At the 3-month follow-up, TSH remained normal, and the volume of the ablated nodule had decreased by 59.9%. There was no intranodular Doppler flow. Her compressive symptoms completely resolved.

Conclusion: These cases are representative of our early experience with thyroid RFA in the USA, and showcase its safety, efficacy and feasibility in the outpatient setting, for patients with toxic or non-toxic symptomatic thyroid nodules.

Reproductive Endocrinology

HYPERANDROGENISM

GnRHR ECL-2 Epitopes Targeted by Activating Autoantibodies in Polycystic Ovary Syndrome

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Background: Activating autoantibodies (AAb) are directed to the gonadotropin releasing hormone receptor second extracellular loop (GnRHR-ECL2) and are pathogenic when induced in rats. We previously reported GnRHR-ECL2-AAb were elevated in sera from patients with PCOS (Rotterdam criteria) compared to ovulatory infertile controls (OIC). **Methods:** *Human studies*: ELISA detection of GnRHR Abs used a synthetic h-GnRHR-ECL2 28 mer peptide (LifeTein) as the target antigen. We assayed AAb activity in GnRHR transfected cells using a GeneBLAzer FRET assay (Invitrogen). ELISA AAb epitope locations on the ECL2 were identified on a minipin plate (pins 1-11 containing sequential 2 aa offsetting octapeptides, Mimotope, Inc) using sera from 30 PCOS subjects, 33 OIC and 18 normal controls (NC). **Results:** *Human sera*: An ELISA assay for GnRHR-ECL2-AAbs in the PCOS group was markedly higher than the NC group (P<0.0001) and the OIC subjects (P<0.003). The minipin data demonstrated one or more positive OD peaks on pins 4 (20%), 5 (47%) and 8 (47%) which shared L-aa sequences FSQC or CSFSQ. OIC had only 5 subjects with peaks at minipins 4 or 5 and NC had only 3 lower peaks and one with higher OD values over all minipins. GnRHR-AAb Specific Activity (SA) was estimated by measuring serum activity before and after suppression of AAb sensitive activity by addition of retro inverso D-aa (RID) peptides. These were specifically designed to mimic and decoy the AAb L-aa epitope sequences of pins 5 and 8). SA was measured in 10 selected PCOS and 10 OIC subjects who had positive ELISA values. The baseline activity in the PCOS group was significantly higher than OIC ($P < 0.01$) and dropped 50% with preincubation with peak 5 RID and 25% with peak 8 RID. The addition of both peak 5 and peak 8 RID suppressed the PCOS group activity to OIC levels ($P > 0.2$). There was no significant change in activity in the OIC subjects by the addition of peaks 5 + 8 RID peptides. **Conclusion:** These PCOS GnRHR-AAb data confirm the presence of significant activation of the GnRHR by AAb targeted to specific epitope(s) proximate to the disulfide GnRHR-ECL2 linkage to the nearby ECL1. These data are compatible with a pathophysiological role for GnRHR-AAb in PCOS and may provide both diagnostic and therapeutic opportunities.