conversion group (all p<0.01). Furthermore, rate of postoperative complications, and hospital and ICU length-of-stay were significantly higher in the conversion-to-open group (p<0.01). Interestingly, there was no statistically significant difference in maximum adrenal tumor diameter, BMI, pheochromocytoma diagnosis, Cushing’s syndrome, and prior abdominal surgery between groups (p>0.05). The risk of conversion to open was not different on multivariable analysis, including tumor size and BMI (p>0.05).

CONCLUSION: Minimally invasive transperitoneal adrenalectomy can be safely completed in most cases. Conversion to open approach is rare and not related to patient-specific factors or pathology. Patients need to be counseled that while risk of conversion to open approach is quite low, we cannot predict which case will require conversion to open.

Understanding Characteristics and Survival of the Various Secretory Types of Adrenocortical Carcinoma
Alaa Sada, MD, Egidal Ahmed, MD, Irina Bancos, MD, Melanie I. Lyden, MD, FACS, Benzoon Dy, MD, FACS, Trenton Foster, MD, Elizabeth B Habermann, PhD, MPH, Travis McKenzie, MD, FACS
Mayo Clinic, Rochester, MN

INTRODUCTION: As adrenocortical carcinoma (ACC) is rare, differences between non-hormone secreting and different types of hormone secreting ACC are not well studied. This study evaluates differences between secretory types of ACC.

METHODS: We identified adult patients who underwent resection of ACC at our institution between 1997-2018. Comparison was performed using Chi square and Wilcoxon rank sum tests. Survival was assessed using Kaplan-Meier analysis and multivariable Cox proportional hazards regression models. Aldosterone secreting ACC were excluded from multivariable models due to the low N of 9.

RESULTS: A total of 185 patients who underwent ACC resection were identified as having: 52% non-secreting, 24% cortisol, 11% mixed hormone, 8% sex hormone and 5% aldosterone secreting ACC. Patients’ sex and tumor size varied across groups. Median overall survival was 73 months for non-secreting, 23 months for cortisol, 56 months for mixed, 22 months for aldosterone, and 125 months for sex hormone secreting ACC, p=0.003. On multivariable analysis, survival was worse for cortisol secreting ACC compared to other types of ACC after adjusting for sex and TNM stage, P<0.05.

CONCLUSION: Secretory types of ACC have different patient and neoplasm characteristics as well as clinical behavior. Cortisol secreting ACC is associated with worse survival compared to other types of ACC. Further studies are needed to determine optimal management for each type of ACC.

An Institutional Summary of Incidence and Risk of Second Primary Cancer (SPC) after Treatment for Papillary Thyroid Carcinoma (PTC)
Heba Elasar, BS, Jordan Reilly, MD, Morte Lapkus, MD, Jacqueline Pasewski, MD, Diane Studzinski, BS, Fiona Sun, BA, Erfan Faridnoayer, MD, Peter F Czako, MD, FACS, Sapna Nagan, MD, FACS
Oakland University William Beaumont School of Medicine, Rochester, MI

INTRODUCTION: Differentiated thyroid cancer (DTC) is the most common endocrine malignancy, accounting for 2.9% of new cancer cases. Decreased mortality and longer survival raise concern for development of SPC. Studies cite up to a 10% rate of SPC after DTC, with increased incidence of SPC among patients with PTC. Radioactive iodine therapy (RAIT) is implicated as a potential reason for SPC. We aimed to determine the incidence of SPC, associated mortality, and relationship with RAIT.

METHODS: Retrospective review of all DTC cases that underwent thyroid surgery at a single institution from January 2007 through December 2011. Preoperative findings, surgical pathology, treatment, and follow-up records were studied.

RESULTS: Of 591 included records, 45 (7.6%) were diagnosed with SPC within follow-up time (median 9.3 years, 7.9-10.0), with median time to SPC diagnosis of 3.8 years (2.0-6.7). 40 of 45 (88.9%) had PTC. The most prevalent form of SPC was breast cancer (30%). All-cause mortality was not significantly different among patients with or without SPC (OR 1.56 (0.34-6.24), p=0.637). There was no significant difference in rate of SPC diagnosis among PTC treated with or without RAIT (p>0.999), and there was no significant dose-response relationship of radioactive iodine with rate of SPC diagnosis (p=0.916).

CONCLUSION: Despite higher incidence of SPC after PTC, there was no increased all-cause mortality in patients with SPC. Although RAIT did not increase risk of developing SPC, therapeutic options should be considered thoughtfully, and surveillance programs for other cancers may need to be considered in long-term follow-up.

Hispanic Race Is an Independent Predictor for Increased Rates of Nodal Disease in Papillary Thyroid Cancer (PTC)
Erin Mackinney, MD, Anna Kloobar, MD, Richard A Prinz, MD, FACS, David J Winchester, MD, FACS, Krista Kutcha, MS, Tricia A Moo-Young, MD
NorthShore University HealthSystem, Evanston, IL

INTRODUCTION: Cancer biology may vary according to race. Based on experience, we hypothesized that Hispanic patients have greater incidence of nodal metastases than other races.
METHODS: Adults undergoing thyroidectomy for PTC from the NCDB 2004-2017 were separated by race into Hispanic, White, Black and Asian/Pacific Islander (API). A 1:1 propensity score matched (PSM) analysis was performed controlling for age, sex, insurance, race, Charlson Comorbidity Index, facility type, histology (classical and aggressive variants), tumor size, multifocality, ETE, and margin status. Differences in nodal metastases were assessed. Kaplan-Meier curves with 10-year overall survival (10-yOS) estimates and log-rank test stratified by race was performed.

RESULTS: 162,752 patients included 15,645 Hispanic, 128,181 White, 9,617 Black, and 9,309 API. Hispanic patients were significantly younger (mean age 44±14 vs White 48±15, Black 48±15, and API 45±14, p<0.001) and less likely to have private insurance (61.2% vs 76.5% White, 64.4% Black and 74.3% API, p<0.001). Hispanics had higher rates of macro-extrathyroidal extension (12.8% vs 8.8% White, 7.3% Black and 11.5% API, p<0.001) and positive margins. Hispanics had a higher incidence of nodal metastases including cN1a, cN1b, pN1a, and pN1b than Whites or Blacks. Hispanics on PSM analysis had higher incidence of both cN disease and pN1a (25.8% and 37.79 ng/ml vs 47.72 ± 20.63 ng/ml, p<0.05 and 37.43 ± 11.37 ng/ml vs 47.72 ± 20.63 ng/ml, p<0.001 respectively). An increase in Ang-1 compared to preoperative levels was observed after thyroidectomy (41.69 ± 2.57 ng/ml vs 53.68 ± 3.25 ng/ml, p<0.05).

CONCLUSION: Hispanics have higher rates of ETE, positive margins and nodal metastases. This may affect management and surveillance of Hispanics with papillary thyroid cancer.

Low Levels of Serum Angiopoietin-1 Are Associated with Benign and Malignant Thyroid Disease

Alexander M Nixon, MD, Xenia ProvatoPoulou, PhD, Elena Kalogera, PhD, Garyfalia Bletsa, MD, Anastasios Philippou, PhD
Henry Dunant Hospital, Athens, Greece
Research Center, Hellenic Anticancer Institute, Athens, Greece
Department of Experimental Physiology, Athens School of Medicine, Athens, Greece

INTRODUCTION: Thyroid cancer is the most common endocrine malignancy and angiogenesis has been shown to play a key role in its development. Activity of the angiopoietin (Ang) family of growth factors has been implicated in tumor-related angiogenesis for several forms of malignancy, including differentiated thyroid cancer.

METHODS: Patients undergoing total thyroidectomy were recruited and divided into three groups: 40 cases with differentiated thyroid cancer, 45 with microcarcinoma and 53 with multinodular hyperplasia. Preoperative circulating levels of Ang-1, Ang-2, VEGF, Galectin-3, uPAR and PAI-1 were determined using enzyme-linked immuno sorbent assay (ELISA). Fifty eight healthy adults participated as healthy controls. Six months after surgery a random sample of patients (n= 28) had circulating levels re-evaluated. Statistical analysis involved one-way multivariate analysis (MANOVA) and subsequent post-hoc analyses. A p value <0.05 was employed to denote statistical significance.

RESULTS: Measured levels of Ang-2, VEGF, Galectin-3, uPAR and PAI-1 did not exhibit statistically significant differences between groups. Significantly lower levels of Ang-1 were observed in patients with cancer, microcarcinoma and benign disease compared to controls (37.79 ± 11.27 ng/ml , 37.19 ± 11.38 ng/ml vs 47.72 ± 20.63 ng/ml, p<0.05 and 37.43 ± 11.37 ng/ml vs 47.72 ± 20.63 ng/ml, p<0.001 respectively). An increase in Ang-1 compared to preoperative levels was observed after thyroidectomy (41.69 ± 2.57 ng/ml vs 53.68 ± 3.25 ng/ml, p<0.05).

CONCLUSION: Lower levels of Ang-1 are associated with benign and malignant thyroid disease. Further studies are required to establish whether Ang-1 can be utilized as a biomarker for thyroid disease.

Retrograde Dissection of the Recurrent Laryngeal Nerve: A Simple and Safe Thyroidecomy Technique

Sergio Zuniga, MD, Pilar M Pinillos, MD, David M Figueroa, Daniela Martinez Penalosa, MD
Universidad Nacional de Colombia, Bogotá D.C, Colombia
Universidad de Antioquia, Medellin, Colombia

INTRODUCTION: The traditional surgical technique for thyroid surgery has limitations in terms of exposure of the recurrent laryngeal nerve. The aim of the study was to describe the experience with an alternative retrograde dissection technique and the factors related to the appearance of postoperative dysphonia with this technique.

METHODS: A retrospective study was conducted with an analysis of the medical records of patients with benign or malignant thyroid pathology, who underwent thyroidectomy with a retrograde dissection technique from 2005 to 2018, in two centers of a low-income country. Demographic variables were evaluated, and the multiple binary logistic regression model was used to establish the relationship between different variables and the probability of presenting dysphonia.

RESULTS: Clinical records of 1627 patients who met the inclusion criteria, were retrospectively analyzed. There was a recurrent laryngeal nerve injury in 7.13% of the exposed nerves, presented as transitory dysphonia in 92.3 % and permanent in 7.7% of the cases. In the multivariate analysis a significant relationship was found between dysphonia in the postoperative period and intraoperative bleeding considered by surgeon difficult to control (p<0.0003). Also, dysphonia was related with extense surgeries that beside total thyroidectomy, included central and bilateral lymph node neck dissection (p=0.019).

CONCLUSION: A technique for approaching the recurrent laryngeal nerve in thyroid surgeries is described, demonstrating its feasibility. Gives surgeons options in the search for the recurrent