Introduction:

Hashimoto's thyroiditis (HT) is the most common cause of hypothyroidism in the United States, and Papillary thyroid cancer (PTC) is the most common type of thyroid cancer. Previous studies have disputed the relationship between HT and development of PTC. Hence, a retrospective study was undertaken to determine the influence of HT on PTC and its clinical and pathological factors in comparison with PTC without HT.

Methods:

We studied 1,025 consecutive patients who underwent thyroidectomy between 1991 and 2013. Data was collected for age, sex, pathology, tumor size, multifocal disease and nodal status. Patients were excluded for insufficient records or data. Data was then analyzed to compare patients with coexisting HT and PTC versus patients with PTC without HT. Data analysis was performed using Chi Squared with a p value of 0.05 or less representing significance. Patients who did not have node dissection were excluded from nodal positivity calculations.

Results:

Of the 1,025 patients, there were 319 (31.1%) with HT and 706 (68.9%) without HT. Male to female ratio was 9/52 in the HT group vs. 35/128 in the non-HT group. Average age was similar in each group, 49.2 in the HT group vs. 52.6 in the non-HT group. In the HT group less patients developed PTC, 61/319 (19.1%) versus 163/706 (23%) in patients without HT. Patients with HT were less likely to be node positive 10/50 (20%) than patients without HT 37/112 (33%). Patients with HT had near equivalent incidence of micro-papillary tumors to patients without HT, 54.1% (33/61) vs. 53.4% (87/163). In patients with HT there was a higher number of multifocal tumors 19/61 (31.2%) vs. 46/163 (28.2%) in those without HT, however, this was not significant. Reference Table I.

Conclusion:

HT is not associated with an increased incidence of PTC. The existence of HT did not correlate with an increased incidence of nodal positive tumors, increase in tumor size or significant difference in the rate of multifocal tumors in patients with PTC. Hence, patients with HT and PTC should not be managed different than PTC patients without HT.

Table I: Pathological Characteristics of Patients with Papillary Thyroid Cancer Patients with and without Hashimoto's.

<table>
<thead>
<tr>
<th></th>
<th>Hashimoto's</th>
<th>Non-Hashimoto's</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papillary Cancer</td>
<td>61/319 (19.1%)</td>
<td>163/706 (23%)</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>Count 1</td>
<td>Count 2</td>
<td>p-value</td>
</tr>
<tr>
<td>------------------------</td>
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<td>---------</td>
</tr>
<tr>
<td>Nodal Positive</td>
<td>10/50 (20.0%)</td>
<td>37/112 (33%)</td>
<td>0.13</td>
</tr>
<tr>
<td>Tumor &gt;1cm</td>
<td>28/61 (45.9%)</td>
<td>76/163 (46.6%)</td>
<td>0.92</td>
</tr>
<tr>
<td>Tumor&lt;1cm</td>
<td>33/61 (54.1%)</td>
<td>87/163 (53.4%)</td>
<td>0.92</td>
</tr>
<tr>
<td>Multifocal Tumor</td>
<td>19/61 (31.2%)</td>
<td>46/163 (28.2%)</td>
<td>0.79</td>
</tr>
</tbody>
</table>
Background: serum thyroglobulin is one of the main tools of follow-up after total thyroidectomy for well-differentiated thyroid carcinoma. One of the arguments to use an ablative dose of I131 after thyroidectomy for low-risk well-differentiated thyroid carcinoma is that this practice helps in postoperative follow-up with serum thyroglobulin, making it more uniform.

Objectives: To analyze the impact of postoperative radioiodine in non-stimulated thyroglobulin values during the early follow-up of patients who underwent total thyroidectomy for low-risk papillary thyroid carcinoma.

Methods: Retrospective analysis of 305 cases of low-risk thyroid cancer treated between 2008 and 2010 in which information relating to radioiodine therapy (RIT), postoperative stimulated thyroglobulin (sTG) and thyroglobulin at 6 months after surgery (TG6m) were available. All cases had anti-thyroglobulin under normal limits.

Results: This sample had 257 women (84.3%). The age range was from 12 to 83 years (median, 43 years). 274 (89.8%) patients had a pT1 tumor and 31 (10.2%) had a pT2 tumor, with only 22 cases (7.2%) of pN1 disease. Radioiodine therapy was used in 234 (76.7%) patients, with a median dose of 136mci. All the cases had stimulated thyroglobulin measured 3-4 weeks after surgery (median of 2.3ng/mL and range between 0.1 and 94ng/mL) and non-stimulated thyroglobulin measured in 6 months follow-up visit (range of 0.1 - 5.9ng/mL) and 80.3% of these were undetectable (<0.2ng/mL). Dividing this sample in groups based on sTG, we found that in patients with sTG < 1ng/mL (99 patients), the radioiodine made no difference in TG6m, with 92.6% rate of undetectable TG6m in the group that did not receive RIT versus 97.2% in the group that received RIT (p=0.29). In the other hand, in patients with sTG > 1ng/mL, we found a significant difference of 59.1% versus 76.5% in undetectable TG6m favoring the RIT group (p=0.02).

Discussion: The use of RIT in low-risk papillary thyroid carcinoma for remnant ablation facilitating follow-up with thyroglobulin is widely accepted and used by several groups, however, there is no clear data showing this advantage. In this analysis we showed that in patients with sTG lower than 1ng/mL, is unlikely that RIT improves the rate of undetectable TG6m, which seems to occur in patients with higher sTG. Therefore, we believe that sTG can be used in low-risk carcinomas to better select patients for remnant ablation.
OVERUSE OF RAI FOR VERY LOW RISK THYROID CANCER IS MOST FREQUENT IN AREAS WITH POOR HEALTHCARE ACCESS

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INTRODUCTION:

American Thyroid Association guidelines currently advise against routine use of postoperative radioactive iodine (RAI) for very low-risk papillary thyroid cancer (PTC), defined as subcentimeter intrathyroidal tumors. Patterns of RAI administration for low-risk PTC vary dramatically across the US, for unclear reasons. We analyzed the association between regional access to healthcare and the pattern of RAI use for very low risk PTC.

METHODS:

We analyzed 13,401 cases of very low risk (defined as <=1cm intrathyroidal N0 M0) classical PTC undergoing total thyroidectomy in 337 US counties (1983-2009), in the SEER 18 cancer registry. County-level access to healthcare was estimated from 8 socioeconomic factors: percentage of county population uninsured, poor, unemployed, white collar employed, non-English speaking, high school educated, college educated, and mean family income. The association between access to care and the probability of RAI use for very low risk PTC was examined using weighted-least squares regression.

RESULTS:

During the study period, 32.9% of very low risk PTC patients received postoperative RAI. This proportion was stable between 1990 and 2009, hovering between 30-36%. When counties were ranked by the socioeconomic factors, RAI use was more common in the lowest decile, compared to the highest decile (42.0% vs 29.8%, p=.04). The 8 socioeconomic covariates together explained 16.7% of the variability in county-level use of RAI for very low risk PTC (r=.41, p<.001). Counties with higher use of RAI had significantly lower levels of income, education and white collar employment, and higher levels of uninsured, non-English speaking, and poor persons.

CONCLUSION:

In the US, RAI is widely overused in very low risk PTC patients, with over 30% of these patients receiving RAI. Levels of access to healthcare are strongly associated with the probability of RAI treatment. Overuse is most frequent in counties with poorer access to healthcare. This association is likely to be multifactorial, attributable to diminished access to experienced specialists, a tendency to pursue more aggressive treatment in certain settings of compromised access to care, or other undefined physician practice patterns, which together result in more widespread use of RAI in very low risk patients.
MULTIPLE PRIMARY TUMOURS OF THYROID CANCER PATIENTS
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Objective. Over the period of many decades, combination of thyroid pathologies with coexisting non-thyroid tumours has been frequently observed. Many experimental and clinical observations have shown that such combinations may be due to the following mechanisms: disturbance of neurohormonal regulation; exposure to ionising radiation; genetic defects (Gardner's syndrome, Cowden's disease, Carney's complex et others).

Design of our research - prospective longitudinal study and open clinical study.

Material and methods. 19198 thyroid patients were treated during 1973-2004. Carcinoma of the thyroid gland constituted 10.4% (2021 pts). Out of these patients malignant tumours were detected in other organs in 5.8% (117 pts). In 86 (0.5%) observations extrathyroid malignant neoplasms were revealed in patients with benign thyroid conditions ? nodular euthyroid goitre, toxic goitre, Hashimoto's thyroiditis (17177 pts). Prospective investigation in cases of benign thyroid diseases was not conducted. Age of patients ranged between 21 and 80 years (mean age made 54.8). An absolute majority of patients constituted of women ? 98.1%, while men constituted 1.9%. Out of 2506 toxic goitre patients, only 12 (0.48%) showed the presence of malignant tumours of other organs.

The control group was constituted of 99 women with thyroid pathology, but without any other tumours. Age of the subjects in control group ranged from 24 years to 82 years, the average age made 53 years. The ratio of the different pathologies of the thyroid in the study group and the control was the same like different histological variants of TC in study and control groups.

TC patients, treated in clinics from 1978 to 2004 were observed in average 12 years, person-years of observation were calculated

Results. The most part (77.7%) of multiple tumours were found to be metachronus. Extrathyroid malignant neoplasms were found for the greater part in organs of female reproductive system. Radioinduced type of polyneoplasia was found in one case (1.8%) only. Clinical course of thyroid cancer was not differ in both study and control groups. Hormone dependent extrathyroid tumours lasted relatively favourably. Average free interval was calculated to be 7.5 years. It was showed that statistically significant increased relative risk was found only in cases of ovarian cancer (5.5) and endometrial cancer (3.97). As regards other tumours, their high relative risk could not be conclusively proved. It was found if thyroid cancer was appeared after extrathyroid malignant neoplasms, the course it was more favourable.

Conclusions. Relative risk of endometrial and ovarian tumours development in TC patients is higher to that of the overall population. Typical duration between of extrathyroid tumours and that of TC appearance was one decade till and after diagnosis of thyroid pathology. Synchronous polyneoplasia were observed in every fifth patient. Prognosis as regards neoplasms in patients of thyroid pathology was determined in the basic character and clinical course of other tumour. Exceptions were anaplastic cancer cases.
S244 PREDICTORS OF 30-DAY READMISSION AFTER OUTPATIENT THYROIDECTOMY. AN ANALYSIS OF THE 2011 NSQIP DATASET.
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Background

With enhancements in patient safety and improvements in anesthesia administration, outpatient surgery has evolved into a safe option for many patients. In keeping with this trend, thyroidectomy is now frequently undertaken as an outpatient procedure, with several peer-reviewed reports of safe implementation totaling over 4500 procedures since 2006. However, robust statistical analyses of predictors for readmission are lacking.

Methods

The 2011 NSQIP dataset was queried to identify all patients undergoing thyroidectomy on an outpatient basis. Outcomes of interest included surgical and medical complications, reoperation, mortality, and readmission. Univariate and multivariate analyses were utilized.

Results

In total 5,121 patients were identified to have undergone an outpatient thyroidectomy in 2011. Overall 30-day morbidity was rare with only 47 patients (0.92%) experiencing any perioperative morbidity. One hundred and eleven (2.17%) patients were readmitted within 30-days of the operation. A history of COPD was the only preoperative comorbid medical condition that significantly increased a patient's risk for readmission (OR 3.73 95% CI 1.57 - 8.85, p = 0.003). Patients with a surgical complication were more than 7 times as likely to be readmitted (OR 2.08 - 25.28, p = 0.002), and those with a medical complication were over 19 times as likely to be readmitted (OR 7.32 - 50.78, p < 0.001).

Conclusions

Readmission after outpatient thyroidectomy is infrequent, and rates of unplanned readmission compare well with other outpatient procedures. The main identified risks include preoperative COPD and and postoperative complications. As procedures continue to transition into outpatient settings and financial penalties associated with readmission become a reality, these findings will serve to optimize outpatient surgery utilization.
S245  POSTOPERATIVE THYROGLOBULIN LEVELS IN PATIENTS WITH POORLY DIFFERENTIATED THYROID CANCER - ARE THEY USEFUL?
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Background & Objectives: Thyroglobulin (Tg) is a specific product of follicular thyroid cells. Following total thyroidectomy +/- RAI, the postoperative Tg level is a reliable marker for residual or recurrent thyroid cancer. Patients with differentiated carcinoma and undetectable Tg levels have very low risk for recurrence. However, the predictive role of an undetectable Tg level in patients with poorly differentiated thyroid carcinomas (PDTC) is unclear. Our aim was to report on Tg levels following total thyroidectomy and adjuvant RAI in patients with PDTC that were M0 at presentation and to correlate Tg levels with recurrence.

Materials and Methods: 40 patients with PDTC with no distant metastases at presentation (M0) and managed by total thyroidectomy and adjuvant RAI were identified from a database of 91 PDTC patients treated with primary surgery at MSKCC from 1986-2009. Of these, 31 patients had Tg values recorded and they formed the basis of our analysis. A non-stimulated Tg level less than 1 ng/ml in the absence of interfering thyroglobulin antibodies was used as a cutoff point for undetectable Tg levels. Tg values prior to adjuvant RAI (post total thyroidectomy) and post adjuvant RAI were recorded. Association of patient and tumor characteristics with Tg levels were examined by the Chi Square test. Recurrence was defined as clinically or radiographically demonstrated tumor in the thyroid bed, neck or distant sites. Recurrence free survival (RFS) stratified by postop Tg level was calculated using the Kaplan-Meier method and compared using the log-rank test. Statistical analysis was performed by SPSS (IBM Company Headquarters, 233 S. Wacker Drive, 11th Floor, Chicago, Illinois 60606).

Results: 20 patients had an undetectable Tg (less than 1 ng/ml) and 11 had detectable Tg (>=1 ng/ml; range 2-129 ng/ml) following surgery. After adjuvant RAI, 24 patients had undetectable Tg (less than 1 ng/ml) and 7 had detectable Tg (>=1 ng/ml; range 1-57 ng/ml). The phenotype of the 7 PDTC patients with detectable Tg following adjuvant RAI was papillary (3 patients), Tall cell variant (1), follicular (1) and mixed phenotype (2). Of 13 patients with positive margins, 5 (38%) had detectable Tg and 8 (62%) undetectable Tg (p=0.03). Patients with detectable Tg levels had worse 5-year regional control than patients with undetectable Tg level (69% vs.96%; p=0.03). Of 6 patients with regional recurrence during 5 year follow-up, 4 (67%) had detectable Tg. Patients with detectable Tg levels had worse 5-year distant control than patients with undetectable Tg level (46% vs. 96% vs. p=0.11). Of 5 patients with distant recurrence during 5 year follow-up, 3 (60%) had detectable Tg.

Conclusions: Postoperative thyroglobulin levels in patients with PDTC appears to have predictive value for recurrence. However, a larger sample size is required to reach a definitive conclusion.
FOLLICULAR VARIANT OF PAPILLARY CARCINOMA: DIFFERENCES FROM CONVENTIONAL PAPILLARY CARCINOMA IN CYTOLOGY AND HIGH RISK FEATURES

Mohamed Mohamed, Rania Mehanna, MB, Fergal O’Duffy, Julie McCarthy, Linda Feeley, Brendan Fitzgerald, Gerard O’Leary, Antoinette Tuthill, Matthew S Murphy, Patrick Sheahan; South Infirmary Victoria University Hospital and Cork University Hospital

Importance: Follicular variant papillary thyroid carcinoma (FVPTC) is an important subtype of papillary thyroid carcinoma (PTC) which can be difficult to diagnose with preoperative cytology.

Objective: To compare conventional and FVPTC with regard to preoperative cytological diagnosis, tumour size at diagnosis, presence of invasion, and implications on patients prognostic score.

Design: Retrospective study

Setting: Academic Teaching Hospital

Participants: Ninety-five patients with conventional (65) or FVPTC (34)

Interventions: Preoperative cytology was reported according to the 5-tier British Thy classification system. Pathological features recorded included tumour size, presence of extrathyroid extension (ETE), and metastases. Prognostic scores were calculated according to the MACIS system.

Main Outcome Measures: Differences in patient demographics, preoperative cytology, tumour pathological features, and prognostic risk category between conventional and FVPTC were studied.

Results: There were no differences in age or sex. Conventional PTC was significantly more likely than FVPTC to have had a preoperative Thy-5 (malignant) cytological diagnosis (p=0.0001); or a preoperative Thy-4/5 (suspicious or positive for malignancy) cytology (p=0.0009). In contrast, FVPTC was significantly more likely to have had a false negative Thy-2 (benign) preoperative cytology (p=0.03).

The mean size of FVPTC (25.9mm) was significantly greater than that of conventional PTC (15.5mm), (p=0.02). Even after exclusion of "coincidental" carcinomas, FVPTC tumours were significantly larger than conventional PTC tumours (31.7mm versus 22.4mm, p=0.03). There was no significant difference in multifocality, bilaterality, or incidence of lymph node metastases. However, FVPTC was significantly less likely to show ETE (0/34 versus 10/65, p=0.01). There were no significant differences in proportion of patients in intermediate/high risk prognostic groups, nor in mean MACIS scores (4.68 versus 4.38, p=0.18) between FVPTC and conventional PTC.

Conclusions: Preoperative cytology from FVPTC is more likely to belong to a lower-risk cytology category, and tumours are larger at time of diagnosis. On the other hand, due to lower incidence of ETE, there is no difference in prognostic score at diagnosis.
**S247 IS NODULE SIZE ASSOCIATED WITH MALIGNANCY RISK IN THYROID FOLLICULAR NEOPLASMS?**
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**Introduction:**

Several prior studies have shown that the risk of malignancy in "follicular neoplasms" is up to 30%, hence, surgery is recommended for such lesions, not for therapeutic purpose but as a "diagnostic" method leading to increased hospital costs and related morbidities. The American Thyroid Association guideline recommends total thyroidectomy for follicular lesions larger than 4cm due to increased risk of malignancy. However, the value of thyroid nodule size in predicting malignancy in fine needle aspiration cytology diagnosed follicular neoplasms is very controversial. The objective of this study is to examine the impact of nodule size on risk of malignancy in indeterminate nodules by performing a meta-analysis of the current literature.

**Methods:**

Meta-analysis with systematic search of PUBMED and EMBASE was performed. Studies examining association between thyroid nodule size and documented malignancy based on the final histological pathology of all nodules were included. The effects of clinicopathologic parameters were calculated. Individual study-specific odds ratios and confidence intervals were calculated and relative risk (RR) group differences were calculated utilizing random-effects models. Patients population was divided into three groups according to the distribution of size of nodules: 0-2.0 cm, 2.0-4.0 cm, and >4 cm.

**Results:**

From 717 potentially relevant publications, 11 studies fulfilled the predetermined inclusion criteria and were included in the current meta-analysis. A total of 2581 nodules were analyzed. Malignancy was identified in 496 (19.2%) nodules. After adjustment for age and gender, patients with nodules in 2.0-4.0 cm range had a greater risk of malignancy than those with nodules less than 2 cm, with a pooled mean RR of 1.800 (95% CI: 1.35-2.41). Patients with nodules >4 cm had a higher incidence of malignancy (95% CI: 1.59-2.50, pooled OR = 1.99) when compared to nodules <2 cm.

**Conclusion:**

Our meta analysis found that increased thyroid nodule size is associated with increased risk of malignancy in follicular neoplasms. However, this emphasizes the need for well-designed studies to appropriately examine this association before making important clinical decisions.
S248  CHILDREN AND ADOLESCENTS THYROID CANCER IN RUSSIA, BELARUS AND UKRAINE BEFORE AND AFTER THE CHERNOBYL DISASTER
Anatoly Romanchishen, PhD, DSc, Valeriy Privalov, PhD, DSc, Alexandr Gostimskiy, PhD, DSc, Alexandr Bogaticov, PhD, Igor Komissarenko, PhD, Yurii Demidchik, PhD, DSc; Department of Hospital Surgery of Saint-Petersburg Pediatric Medical University. Saint-Petersburg Center of Endocrine Surgery and Oncology. Russia

**Background.** Russian Federation, Belarus and Ukraine are the three countries that suffered most severely from the Chernobyl nuclear accident. The years after that tragedy are quite a sufficient time to analyse the results of possible radiation exposure on the thyroid, particularly in children.

**Purpose.** To hold the retrospective analysis of the impact of ionizing radiation after Chernobyl accident on morbidity dynamics and features of sporadic, endemic, radioinduced thyroid cancer (TC) in children.

**Materials/Methods.** In the present research we included 1942 TC children representing 3 groups:

1st group - 190 patients from Chelyabinsk and Archangelsk (goiter endemic zones);
2nd group - 105 patients from St.-Petersburg (sporadic TC);
3rd group - 1647 patients from Minsk and Kiev (with radiation-induced TC).

**Results.** Average age of patients was 13.4±0.74 (15.5, 16.2, 13.4 in 1, 2 and 3 groups accordingly). There were 655 boys and 1287 girls, ratio 1:2 (range 1:3.8, 1:2.9, and 1:1.8). Regional TC metastases rate was 61.9% (range 29.0%, 53.0%, 66.3% in 1-3 groups). Extra-thyroid tumor spread rate was 18.4% (4.5%, 17.9%, 20.0%). Multi-central TC growths were found in 19.7% (13.3%, 8.5%, and 21.1%) of cases. Preoperative distant TC metastases were revealed in 12.1% (1.6%, 10.5%, and 13.4%) of cases. During the nearest 10 years after surgical treatment, additional remote metastases (mainly in lungs) were found in 8.9% (1.1%, 2.4%, and 10.2%) of observations. Organ-saving operations were performed in 38.0% (88.2%, 64.3%, and 30.6%) cases. Postoperative specific complications rate were observed in 7.9% and depended on professional experience of the surgeons. That is why it was 4.7% in the first, 2.6% - in the second, and 8.6% - in the third group. No local relapses were registered in the first group. Relapse after hemithyroidectomy was detected in one case (0.5%) from group 2. Local relapses after organ-saving interventions and thyroidectomy appeared in 2.3%, of cases in the third group with radio-induced TC. Repeated lymph node metastases were found in 9.0% (4.4%, 8.4%, 9.6%). Follow-up (10 - 20 years) results of TC were performed in 95% of treated children and adolescents.

**Conclusion.** The childhood (0-14 years) TC incidence rate peaked in 1993-1995, the peak of adolescents (15-19 years) TC incidence rate was reached in 2001 - 2002, while the rate of young adult (up to 35 years) TC incidence continues to increase. This phenomenon can be explained by natural aging in the cohort exposed to ionizing radiation. The dynamics of TC incidence of Saint-Petersburg pediatric populations resembled and coincided with TC incidence rates in Belarus and Ukrainian children, adolescents and young adults exposed to radioactive iodine spill. TC in children and adolescents were characterized by aggressive behavior. Sporadic and radio-induced TC appears to be more aggressive than carcinomas in patients from iodine-deficiency areas. This manifested as more frequent extracapsular extensions, as well as regional and distant metastases. Thyroidectomies were performed by
experienced surgeons and were supplemented by radioiodine therapy (if needed), which prevented relapses of the disease and provided cure in more than 95% of children and adolescent patients.