

Table S1- Treatment modalities and follow-up data of patients with DTC, according to their BMI group[†]

| | | Normal weight BMI 18.5-24.9 N=47, 28.5% | Overweight and obese BMI ≥ 25 N=118, 71.5% | P value |
|--|-------------------------|---|--|---------|
| Thyroid surgery (n,%) | Partial | 18, 38.3% | 24, 20.34% | 0.017 |
| | Complete | 29, 61.7% | 94, 79.66% | |
| RAI treatment (n,%) | No | 24, 51.06% | 47, 39.83% | 0.272 |
| | 30 mCi | 5, 10.64% | 23, 19.49% | |
| | ≥100 mCi | 14, 29.79% | 38, 32.2% | |
| Risk assessment [‡] (n,%) | Low | 27, 57.45% | 54, 45.76% | 0.21 |
| | Intermediate or high | 16, 34.04% | 54, 45.76% | |
| Response to treatment [§] (n,%) | Excellent | 36, 76.6% | 76, 64.41% | 0.149 |
| | Incomplete [#] | 3, 6.38% | 16, 13.56% | |
| Additional intervention [@] (n,%) | | 0, 0% | 8, 6.78% | 0.106 |

[†]Sub-group analysis of patients whose age was 30-70 years at the time of the index thyroid surgery; a comparison of two BMI groups- normal weight versus overweight and obese; [‡]Risk of structural disease recurrence; [§]Response to treatment at the end of follow-up; [#]Biochemical and/or structural[^]; [@]Second thyroid operation, and/or neck dissection, and/or second RAI treatment, and/or external beam irradiation; Due to missing data in some variables the total percent per column might not summarize to 100%.

Abbreviations: DTC- differentiated thyroid carcinoma, BMI- body mass index (body weight [Kg] divided by the square of height [meters]), N- number, RAI- radioactive iodine, mCi- millicurie

[^]Haugen BR, Alexander EK, Bible KC, Doherty GM, Mandel SJ, Nikiforov YE, Pacini F, Randolph GW, Sawka AM, Schlumberger M, Schuff KG, Sherman SI, Sosa JA, Steward DL, Tuttle RM, Wartofsky L. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid*. 2016 Jan;26(1):1-133. doi: 10.1089/thy.2015.0020. PMID: 26462967; PMCID: PMC4739132.

Table S2- Histopathological features (full description) following thyroid surgery of patients with DTC, according to their BMI group

| | | | Normal weight BMI 18.5-24.9 N=66 , 31.3% | Overweight BMI 25-29.9 N=81 , 38.4% | Obesity BMI ≥30 N=64 , 30.3% | P value* |
|--------------|-------------------------------------|-------------------------|--|---|------------------------------------|--------------------|
| Tumor | pT (n,%) | pT 1-2 | 55, 83.33% | 63, 77.78% | 50, 78.13% | * 0.763 a 0.484 |
| | | pT 3-4 | 11, 16.67% | 17, 20.99% | 13, 20.31% | b 0.563 c 0.929 |
| | Histological sub-type (n,%) | PTC | 60, 90.91% | 75, 92.59% | 60, 93.75% | * 1 a 1 |
| | | FTC | 5, 7.58% | 6, 7.41% | 4, 6.25% | b 1 c 1 |
| | PTC variant (n,%) | Classic | 32, 48.48% | 25, 30.86% | 20, 31.25% | * 0.62 a 0.6 |
| | | Follicular | 24, 36.36% | 41, 50.62% | 30, 46.88% | b 0.332 |
| | | Aggressive [‡] | 4, 6.06% | 9, 11.11% | 10, 15.63% | c 0.69 |
| | Multifocality (n,%) | No | 39, 59.09% | 43, 53.09% | 40, 62.5% | * 0.486 a 0.403 |
| | | Yes | 26, 39.39% | 38, 46.91% | 24, 37.5% | b 0.771 c 0.255 |
| | Two lobes involvement (n,%) | No | 39, 59.09% | 43, 53.09% | 40, 62.5% | * 0.642 a 0.347 |
| | | Yes | 15, 22.73% | 24, 29.63% | 19, 29.69% | b 0.608 c 0.669 |
| | Extrathyroidal extension (n,%) | None | 51, 77.27% | 57, 70.37% | 43, 67.19% | * 0.45 a 0.6 |
| | | Microscopic | 9, 13.64% | 14, 17.28% | 19, 29.69% | b 0.035 |
| | | Gross | 5, 7.58% | 9, 11.11% | 1, 1.56% | c 0.027 |
| | Vascular invasion (n,%) | No | 50, 75.76% | 67, 82.72% | 53, 82.81% | * 0.533 a 0.383 |
| | | Yes | 15, 22.73% | 14, 17.28% | 10, 15.63% | b 0.304 c 0.822 |
| LN | LN MTS (n,%) | No | 52, 78.79% | 59, 72.84% | 41, 64.06% | * 0.349 a 0.372 |
| | | N1a | 6, 9.09% | 14, 17.28% | 13, 20.31% | b 0.129 |
| | | N1b | 7, 10.61% | 8, 9.88% | 9, 14.06% | c 0.576 |
| | Bilateral lateral neck LN MRS (n,%) | No | 66, 100% | 79, 97.53% | 61, 95.31% | * 0.233 a 0.502 |
| | | Yes | 0, 0% | 2, 2.47% | 3, 4.69% | b 0.116 c 0.655 |

| | | | | | | |
|-------------------------------|--|------------|------------|------------|--|--|
| | >5 LN MTS [§] (n,%) | No | 59, 89.39% | 73, 90.12% | 54, 84.38% | * 0.529 a 0.884 b 0.396 c 0.297 |
| | | Yes | 7, 10.61% | 8, 9.88% | 10, 15.63% | |
| | LN diameter≥3 cm [#] (n,%) | No | 64, 96.97% | 81, 100% | 60, 93.75% | * 0.037 a 0.2 b 0.437 c 0.036 |
| | | Yes | 2, 3.03% | 0, 0% | 4, 6.25% | |
| | Extra-nodal extension [#] (n,%) | No | 61, 92.42% | 72, 88.89% | 55, 85.94% | * 0.436 a 0.754 b 0.204 c 0.46 |
| | | Yes | 4, 6.06% | 7, 8.64% | 8, 12.5% | |
| Distal MTS [#] (n,%) | No | 61, 92.42% | 79, 97.53% | 63, 98.44% | * 0.134 a 0.407 b 0.119 c 0.504 | |
| | Yes | 4, 6.06% | 2, 2.47% | 0, 0% | | |

Abbreviations: DTC- differentiated thyroid carcinoma, BMI- body mass index (body weight [Kg] divided by the square of height [meters]), N- number, PTC- papillary thyroid carcinoma, FTC- follicular thyroid carcinoma, LN- Lymph node/s, MTS- Metastasis

* Comparison of all 3 sub-groups, a- overweight versus normal weight, b-Obese versus normal weight, c- obese versus overweight; [¥]Oncocytic, tall cell, insular, moderately differentiated, and poorly differentiated variants; [§] Central (level 6) and/or Lateral (levels 1-5); [#]One or more
Due to missing data in some variables the total percent per column might not summarize to 100%.

Table S3- Association between fasting glucose as a continuous variable and selected histopathological features

| histopathological feature | Sub-categories | Unadjusted Odds Ratio (95% CI)* | Adjusted [@] Odds Ratio (95% CI)* |
|------------------------------------|---|---------------------------------|--|
| Histological sub-type and variants | PTC- classic variant | 1.00 (REF) | 1.00 (REF) |
| | PTC- Follicular variant | 1 (0.988-1.013) | 0.996 (0.983-1.008) |
| | Aggressive variant [‡] of PTC and/or FTC | 1.001 (0.985-1.017) | 0.992 (0.973-1.011) |
| Extrathyroidal extension | None | 1.00 (REF) | 1.00 (REF) |
| | Microscopic | 0.998 (0.983-1.014) | 0.996 (0.978-1.013) |
| | Gross | 1.003 (0.985-1.022) | 0.999 (0.979-1.02) |
| Vascular invasion | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 0.988 (0.967-1.01) | 0.986 (0.963-1.009) |
| Multifocality | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 0.999 (0.987-1.01) | 0.997 (0.985-1.009) |
| Lateral neck LN MTS | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 1.002 (0.971-1.035) | 1.001 (0.967-1.037) |
| LN MTS ≥ 3 cm | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 1 (0.965-1.037) | 1.004 (0.971-1.039) |
| Extra-nodal extension | No | 1.00 (REF) | 1.00 (REF) |
| | Gross | 1.004 (0.988-1.021) | 1.004 (0.986-1.023) |
| Distal MTS | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 1.006 (0.98-1.033) | 1.001 (0.969-1.034) |

[@]Adjusted for age, sex, and ethnicity; *Bolded for $p \leq 0.05$; [‡] Tall cell, columnar, and insular variants of PTC together with moderately and poorly differentiated variants.

Abbreviations: CI- confidence interval, PTC- papillary thyroid carcinoma, FTC- follicular thyroid carcinoma, LN- Lymph node/s, MTS- Metastasis

Table S4- Association between triglyceride level as a continuous variable and selected histopathological features

| Clinical/ histopathological feature | Sub-categories | Unadjusted Odds Ratio (95% CI)* | Adjusted [@] Odds Ratio (95% CI)* |
|---|--|------------------------------------|---|
| Histological sub-type and variants | PTC- classic variant | 1.00 (REF) | 1.00 (REF) |
| | PTC- Follicular variant | 1.001 (0.997-1.006) | 1.001 (0.996-1.006) |
| | Aggressive variant [‡] of PTC and/or FTC | 1.005 (1-1.011) | 1.004 (0.998-1.01) |
| Extrathyroidal extension | None | 1.00 (REF) | 1.00 (REF) |
| | Microscopic | 1.002 (0.997-1.006) | 1.001 (0.996-1.006) |
| | Gross | 0.996 (0.988-1.005) | 0.993 (0.984-1.003) |
| Vascular invasion | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 0.999 (0.993-1.004) | 0.998 (0.993-1.004) |
| Multifocality | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 1.001 (0.997-1.005) | 1 (0.996-1.004) |
| Lateral neck LN MTS | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 0.996 (0.981-1.011) | 0.991 (0.974-1.009) |
| LN MTS ≥ 3 cm | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 1.007 (0.996-1.017) | 1.005 (0.994-1.017) |
| Extra-nodal extension | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 1.001 (0.994-1.008) | 0.999 (0.991-1.007) |
| Distal MTS | No | 1.00 (REF) | 1.00 (REF) |
| | Yes | 0.997 (0.981-1.013) | 0.994 (0.977-1.012) |

[@]Adjusted for age, sex, and ethnicity; *Bolted for $p \leq 0.05$; [‡]Tall cell, columnar, and insular variants of PTC together with moderately and poorly differentiated variants.

Abbreviations: CI- confidence interval, PTC- papillary thyroid carcinoma, FTC- follicular thyroid carcinoma, LN- Lymph node/s, MTS- Metastasis