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Differences in hemithyroidectomy rates and radioactive iodine use for patients with low-risk papillary and follicular thyroid cancers – A binational cohort study

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Summary
Patients with low-grade PTC and FTC receive different extent of surgery and are treated with RAI at different rates. However, the decision seems to be associated with *lymphovascular invasion* and *lymph node metastasis.* Cancer subtype, sex, age and tumour size associating with those decisions to a lesser extent.

Introduction

The 2015 ATA guidelines state hemithyroidectomy alone can be performed for low-risk differentiated thyroid cancers (DTC) under 4 cm. It is unclear if cancer subtype, papillary thyroid cancer (PTC) or follicular thyroid cancer (FTC), influences clinical practice.

Primary Aim: Determine if patients with different cancer subtypes (PTC vs FTC) are treated with different extent of initial surgery and rate of radioactive iodine (RAI) therapy.
Secondary Aim: Investigate independent factors associated with extent of surgery and RAI ablation.

Methods

Adults with low-risk PTC and FTC measuring 1 to 4 cm were recruited from the Australia & New Zealand Thyroid Cancer Registry (2017-2023). The rate of hemithyroidectomy, completion thyroidectomy, total thyroidectomy and RAI therapy were compared between groups. Multivariate analyses were used to determine the association between clinicopathological parameters and treatment.

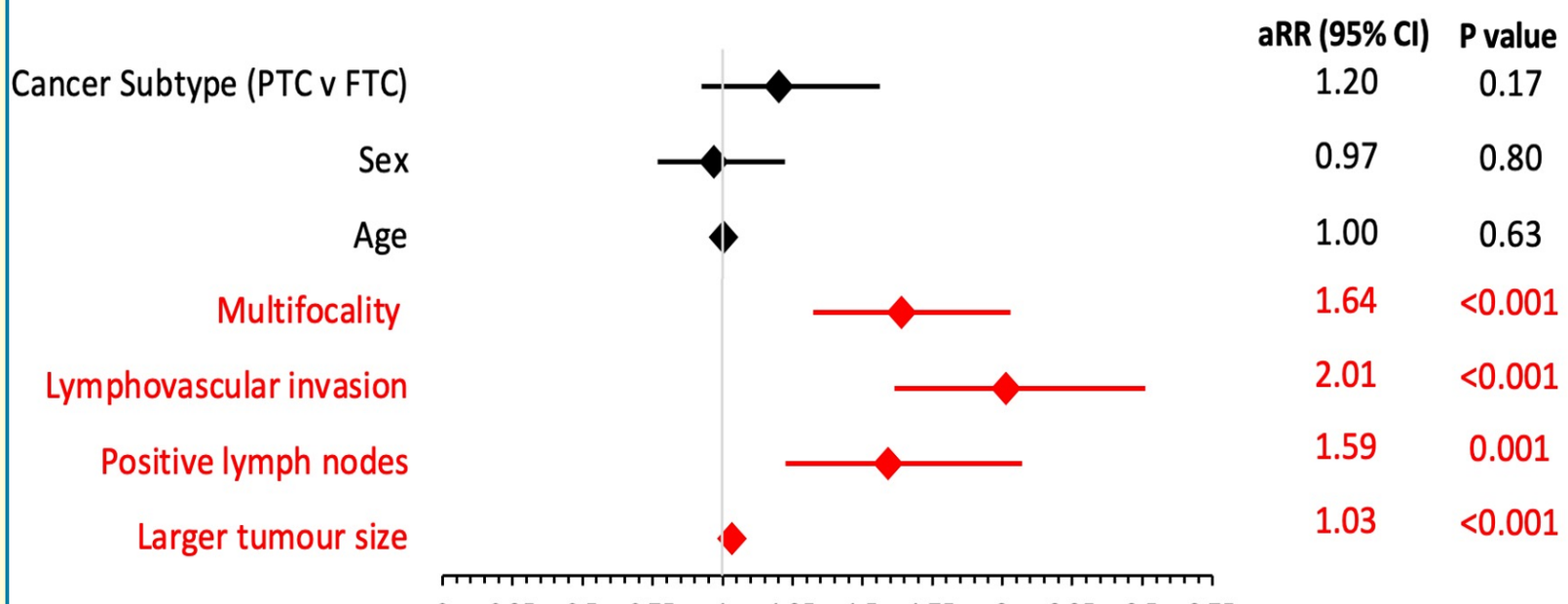
Results

Univariate analysis (**Table 1**) of 1048 patients showed that the rate of hemithyroidectomy alone was higher for patients with FTC (36 vs 23 %, P = 0.001). PTC patients had a higher rate of upfront total thyroidectomy (63 vs 23 %, P < 0.001), while FTC patients had higher rates of completion after initial hemithyroidectomy (53 vs 38 %, P = 0.01). In contrast, the rates of adjuvant RAI were similar between the cancer subtypes, but more patients with PTC were treated with high dose of RAI (77.5 vs 75 % had high dose, P = 0.003).

	HTx[1] only	HTx+CTx[2]	TTx[3]
PTC, N=924 (%)	210 (23%)	131 (14%)	583 (63%)
FTC, N=124 (%)	45 (36%)	51 (41%)	28 (23%)
P-value	0.001	0.01	< 0.001

Table 1 Extent of thyroidectomy. *HTx, hemithyroidectomy; CTx, completion thyroidectomy; TTx, total thyroidectomy.*

Fig 1 Multivariate analysis for factors associated with completion after initial hemithyroidectomy



Multivariate analysis showed that *multifocality*, *lymphovascular invasion*, *lymph node metastasis* and *larger tumour size,* not cancer subtype, were associated with completion after initial hemithyroidectomy (**Fig 1**) and the administration of adjuvant RAI ablation (not shown).

Fig 2 Multivariate analysis for factors associated with RAI in different sizes

Results - subgroup analysis by size

Subgroup analysis was performed based on 5-mm increments in tumour size. For completion thyroidectomy, the presence of *lymphovascular invasion* or *lymph node metastasis* were consistently independent associations across all size categories, while cancer subtype had little influence.

However, cancer subtype was independently associated with RAI rates in tumours at either end of the size spectrum: 11-15mm & 31- 40mm
(Shown with * in **Fig 2**).

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