How accurately can computed tomography predict thyroid invasion prior to laryngectomy?

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1 Traditionally a hemi or total thyroidectomy is contemplated during a total laryngectomy. However, there is no evidence to support this decision. There is evidence that removing part of, or the entire thyroid gland, may result in early or permanent hypoparathyroidism. This project seeks to evaluate preoperative CT as a test of thyroid gland invasion.

3 79 patients were included

Negative thyroid involvement: 70

Mean Age: 65
Male: 84%
T3/T4: 90%
N+:26%
Salvage procedure: 36%

Hemithyroidectomy: 83%
Total Thyroidectomy: 6%

Positive thyroid involvement: 9 patients (11%)

Mean Age: 64
Male: 67%
T4: 100%
N+:78%
Salvage procedure: 11%

Hemithyroidectomy: 67%
Total Thyroidectomy: 33%

4 Laryngeal cartilage invasion on pre-op CT compared to thyroid gland invasion on histology.

	Thyroid invasion	No thyroid invasion
Cartilage invasion on CT	9 True Positive	8 False Positive
No cartilage invasion on CT	0 False negative	62 True Negative

Sensitivity:100% (95% CI 66-100%)
Specificity: 89% (95% CI 79-95%)
Positive predictive value: 53% (95% CI 29-76%)
Negative predictive value: 100% (95% CI 93-100%)
Accuracy: 90%

5 Extra-laryngeal spread on CT compared to thyroid gland invasion on histology

	Thyroid invasion	No thyroid invasion
Extra-laryngeal spread on CT	9 True Positive	0 False Positive
No extra-laryngeal spread on CT	0 False Negative	70 True Negative

Sensitivity: 100% (95% CI 66-100%)
Specificity: 100% (95% CI 95-100%)
Positive predictive value: 100% (95%CI 63-100%)
Negative predictive value: 100% (95%CI 94-100%)
Accuracy: 100%

Extra-laryngeal spread on CT compared to thyroid gland invasion on histology has a high specificity with narrow confidence intervals.

6 Absence of extra-laryngeal spread on CT is highly unlikely to be associated with thyroid gland invasion. Preserving the entire gland in this setting should be considered.