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Comparison of thyroid volume measured by means of ultrasonography and surgery in patients undergoing total thyroidectomy: a prospective study

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PURPOSE: To compare the estimated thyroid volume (ETV) by using US with specimen thyroid volume (STV) obtained by measuring the excised gland after surgery.

MATERIALS AND METHODS: Between October 2011 and January 2012, 52 patients undergoing total thyroidectomy for papillary thyroid cancer were included in this prospective study. The preoperative estimated thyroid volume (ETV) was measured by using ultrasonography with ellipsoid volume formula (anterior diameter x transverse diameter longitudinal diameter x $\pi/6$) and compared with the specimen thyroid volume (STV) measured by the Archimedes' principle after surgery. We statistically analyzed the difference and correlation of ETV and STV.

RESULTS: The mean ETV and STV were 19.41 ± 6.39 ml and 18.54 ± 5.99 ml, respectively. The mean volume difference between ETV and STV were 2.62 ± 1.81 ml ($15.60 \pm 12.46\%$). In small volume group (mean ETV ≤ 17 ml), the mean ETV and STV were 15.21 ± 3.72 ml and 13.92 ± 2.40 ml. In large volume group (mean ETV > 17 ml), the mean ETV and STV were 23.61 ± 5.73 ml and 23.15 ± 4.82 ml. In total group, small volume group and large volume group, there was no statistically significant difference between ETV and STV ($p = 0.475$, $p = 0.144$ and $p = 0.759$). The coefficient of correlation (R^2) was 0.771, 0.233 and 0.755 in total group, small volume group and large volume group.

CONCLUSION: Thyroid volume measured by ultrasonography provided a reliable preoperative estimate of thyroid volume nevertheless the ETV in small volume group (≤ 17 ml) was less reliable than in large volume group (> 17 ml).