

# THYROGLOBULIN IN FINE-NEEDLE ASPIRATION WASHOUT DIAGNOSTIC PERFORMANCE: A META-ANALYSIS



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## BACKGROUND

Differentiated thyroid cancer (DTC) has an excellent prognosis. However, DTC frequently metastasizes to cervical lymph nodes (CLN). In case of suspicious ultrasonographic findings, the fine-needle aspiration (FNA) is usually required to confirm or exclude metastasis. The combination of FNA-cytology and thyroglobulin (Tg) measurements in the needle washout has been reported to increase the sensitivity of FNA in identifying lymph node metastases from DTC, particularly in the case of very small CLN. This assay is recommended by the revised American Thyroid Association guidelines for the follow-up of patients with DTC.

## METHODS

We have selected, through electronic databases, 28 original studies, published from 1992 to 2012. Each study deals with a small number of patients and is likely affected by selection bias. Pooled sensitivity, specificity, likelihood ratios (LR) and diagnostic odds ratio (dOR) were calculated.

## RESULTS

Processing all the studies with complete data (17 studies), the following results have been achieved: **pooled sensitivity 95.8%** (95% CI 94.3-97%), **specificity 91.5%** (95% CI 89.1-93.5%), positive LR 15.33 (95% CI 6.97-33.70), and negative LR 0.06 (95% CI 0.04 – 0.11). However, there is a significant heterogeneity between studies, not due to threshold effect (Spearman correlation coefficient -0.146;  $p=0.52$ ). A meta-regression analysis demonstrated that the presence or absence of thyroid gland (evaluation before thyroidectomy or during after-surgery follow-up) is an important heterogeneity factor (rdOR 4.57; 95% CI 1.34-15.61;  $p=0.02$ ). Processing the data from patients during follow-up (10 studies, Figure 1), it resulted that **the pooled sensitivity is 98.7%** (95% CI 96.8%-99.7%), **specificity 97.9%** (95% CI 95.2-99.3%), positive LR 17.47 (95% CI 7.81-39.10), and negative LR 0.04 (95% CI 0.02-0.09)

## CONCLUSION

**FNA-Tg measurement is a very accurate tool to detect CLN metastases from DTC. However, a better standardization of criteria for patient selection, analytical methods and threshold levels is required to provide useful data and to improve management of DTC patients.**

## STUDIES INCLUDED IN THE ANALYSIS

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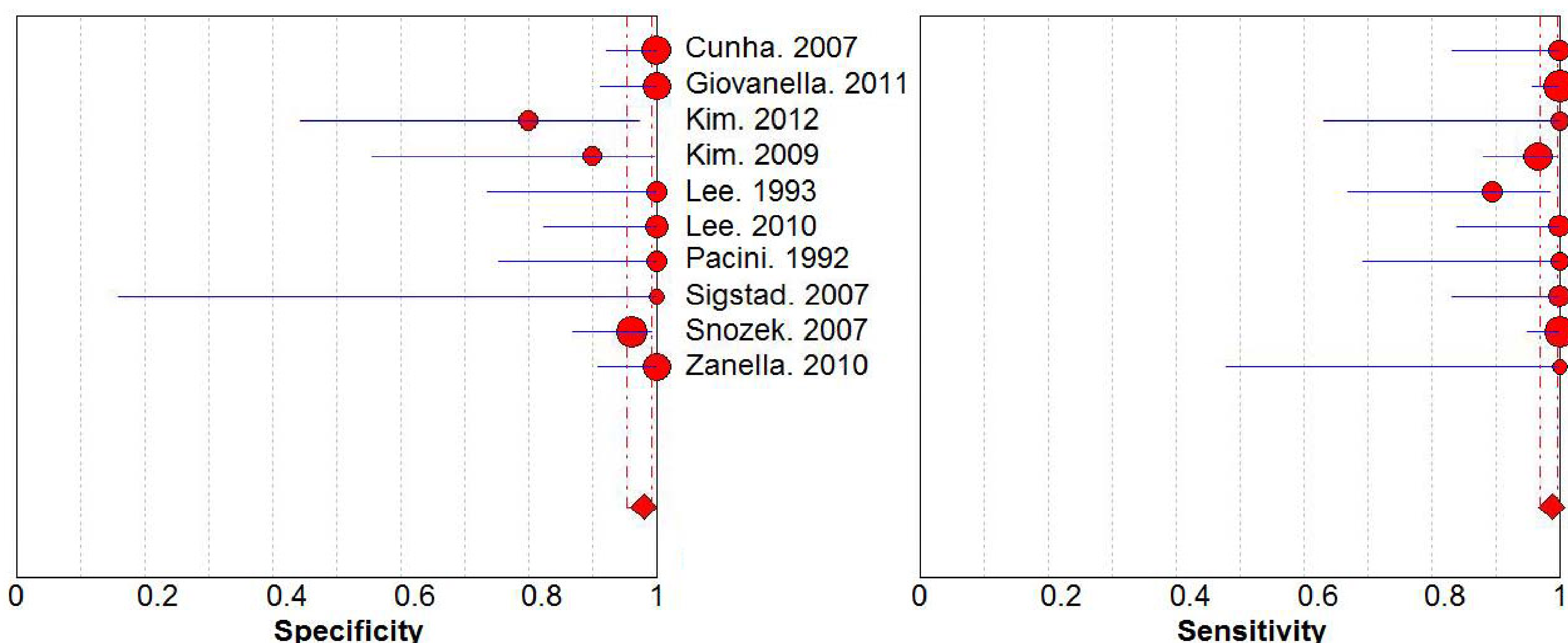
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**Figure 1: Forest plot of pooled sensitivity and specificity, including only 10 studies reporting data from patients during follow-up.**

For specificity: heterogeneity chi-squared = 12.74 (d.f.= 9)  $p = 0.175$   
For sensitivity: heterogeneity chi-squared = 15.19 (d.f.= 9)  $p = 0.086$   
(not significant heterogeneity between studies)

