

# USEFULNESS OF THE ASSESSMENT OF THYROID BLOOD FLOW AS A PREDICTOR OF RELAPSE OF GRAVES' DISEASE

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## OBJECTIVES

We investigated the clinical usefulness of thyroid blood-flow measurement by colour-flow Doppler ultrasonography in predicting relapse of Graves' disease (GD).

## METHODS

In 30 euthyroid GD patients, (8 males, 23 females), aged 17-68 years (mean  $43.8 \pm 12.8$ ), after at least one year of treatment with anti-thyroid drug (ATD) and just before its withdrawal, we evaluate with color-flow Doppler ultrasonography the color Doppler flow mapping (the amount of flow was classified on four point scale, 0-3) and we calculate, in pulsed Doppler mode, the peak systolic velocity in the inferior thyroid artery (ITA-PSV). All ultrasound examinations were performed by the same endocrinologist expert in thyroid ultrasound using a duplex Doppler apparatus (Logic Scan 64, B-Side Medical System) with an 8 MHz linear array probe. Clinical data was collected and measurements of TSH, serum free thyroxine and TSH receptor antibodies were performed. GD relapse was defined as an increase in the serum level of FT4 to above the normal upper range and suppression of serum TSH in eighteen months after removal of ATD. U-Mann Whitney test and Fisher exact test were used for statistical analysis. The sensitivity and specificity were calculated using a 2x2 contingency table.

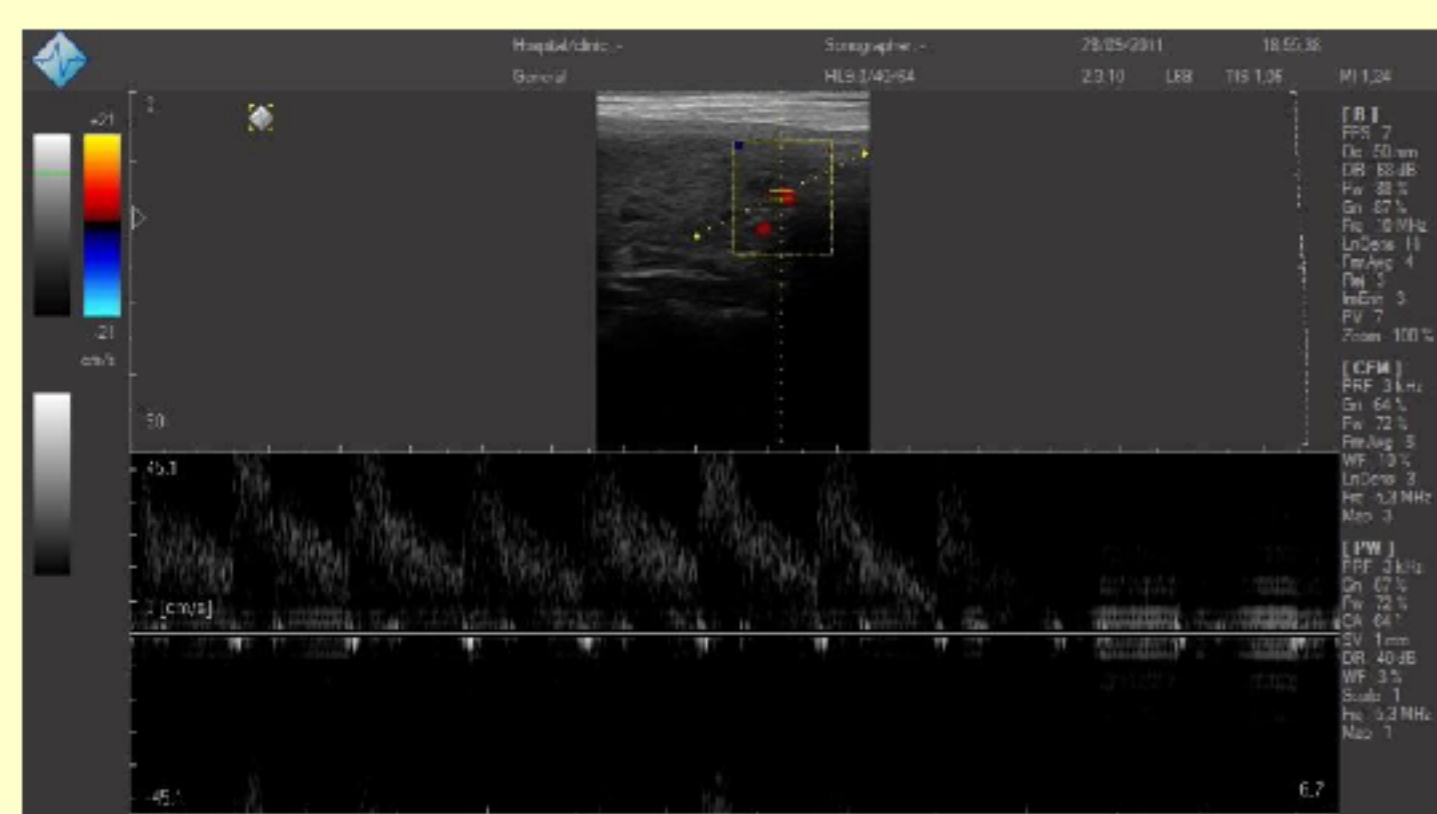


Figura 1. Duplex Doppler recording of the ITA in patient with Graves' disease

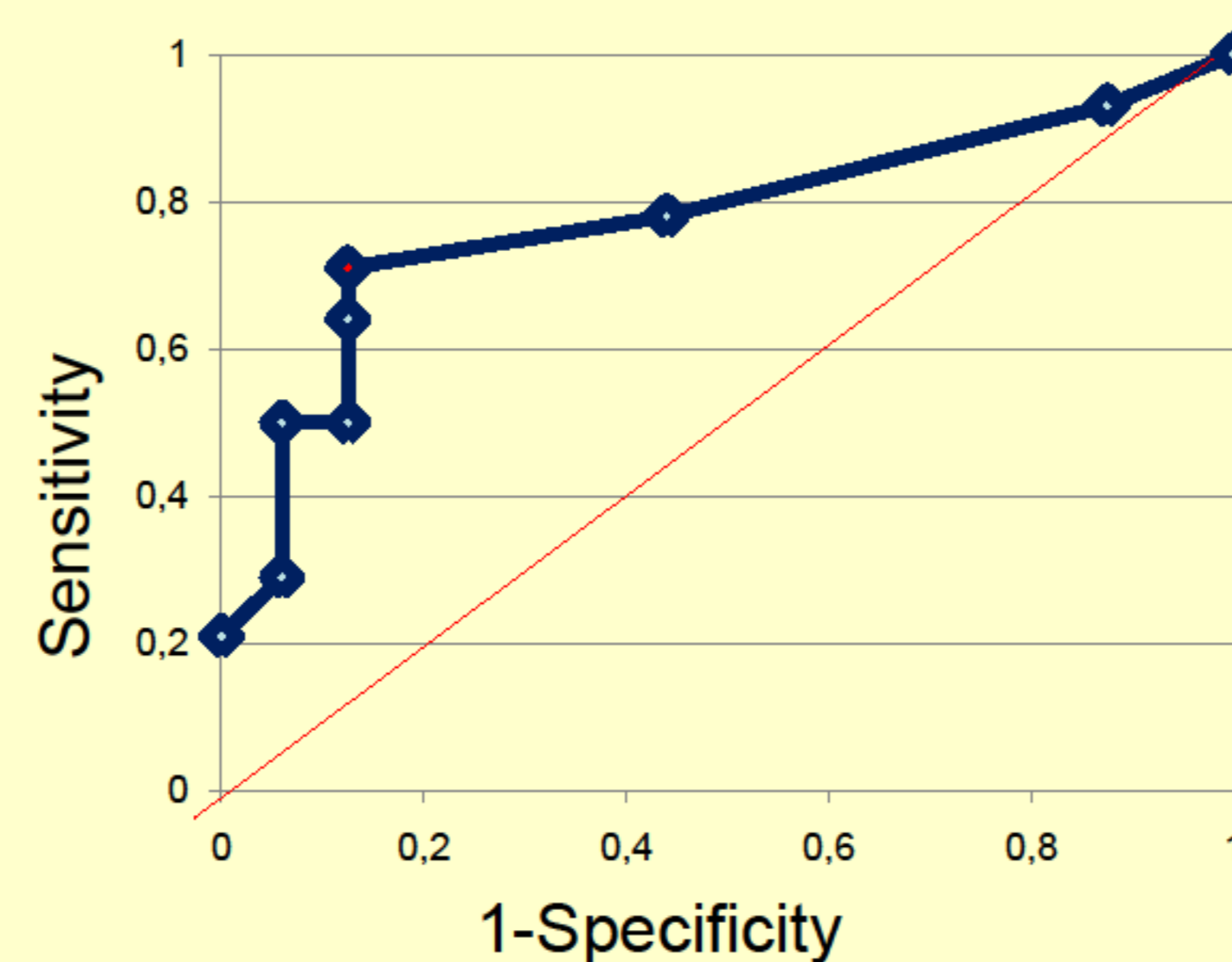


Figura 2. ROC values to determine best cut of ITA-PSV

Table 1. Comparison of parameters between relapse group and nonrelapse group

	Relapse group	Nonrelapse group	p
N (females/males)	14 (10/4)	16 (12/4)	
Age (years)	$42,0 \pm 11,9$	$46,9 \pm 14,1$	ns
TRAb positives (%)	7 (50%)	6 (37%)	ns
Thyroid volume (ml)	$18,5 \pm 6,2$	$15,3 \pm 5,8$	ns
ITA-PSV (cm/s)	$48,4 \pm 17,7$	$32,6 \pm 9,5$	0.01
Color flow doppler mapping 2-3	6 (43%)	3 (19%)	0.01

## RESULTS

In relapse group (n= 14, 47%) ITA-PSV was significantly higher than in the non-relapse group (n=16), ( $48.5 \pm 17.7$  vs  $32.6 \pm 9.5$  cm/seg,  $p=0.01$ ). For prediction of GD relapse, the best cut-off value was 35 cm/s for ITA-PSV. Sensitivity was 71%, Specificity 87%, Positive predictive value 83% and Negative predictive value 78%. All patients with grade 3 in colour Doppler flow mapping (n=3) had an early relapse of GD (before the first 6 months).

## CONCLUSIONS

Color-flow Doppler mapping study and measurement of ITA/PSV in euthyroid GD patients immediately before withdrawal of ATD may assist in the prediction of GD relapse.

## References

1. Ueda M, Inaba M, Kumeda Y et al. *Clinical Endocrinology* 2005; 63: 657-62
2. Hari Kumar KV, Pasupuleti V, Jayaraman M et al. *Endocr Pract* 2009; 15: 6-9
3. Donkol RH, Nada AM, Boughattas S. *World J Radiol* 2013; 5: 178-83

