

REAL-TIME SHEAR WAVE ELASTOGRAPHY (SWE) IN THE EVALUATION OF PARATHYROID ADENOMAS

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OBJECTIVES

Real-time shear wave ultrasound elastography (SWE) is a new technique, which evaluates elasticity and stiffness of the different structure.

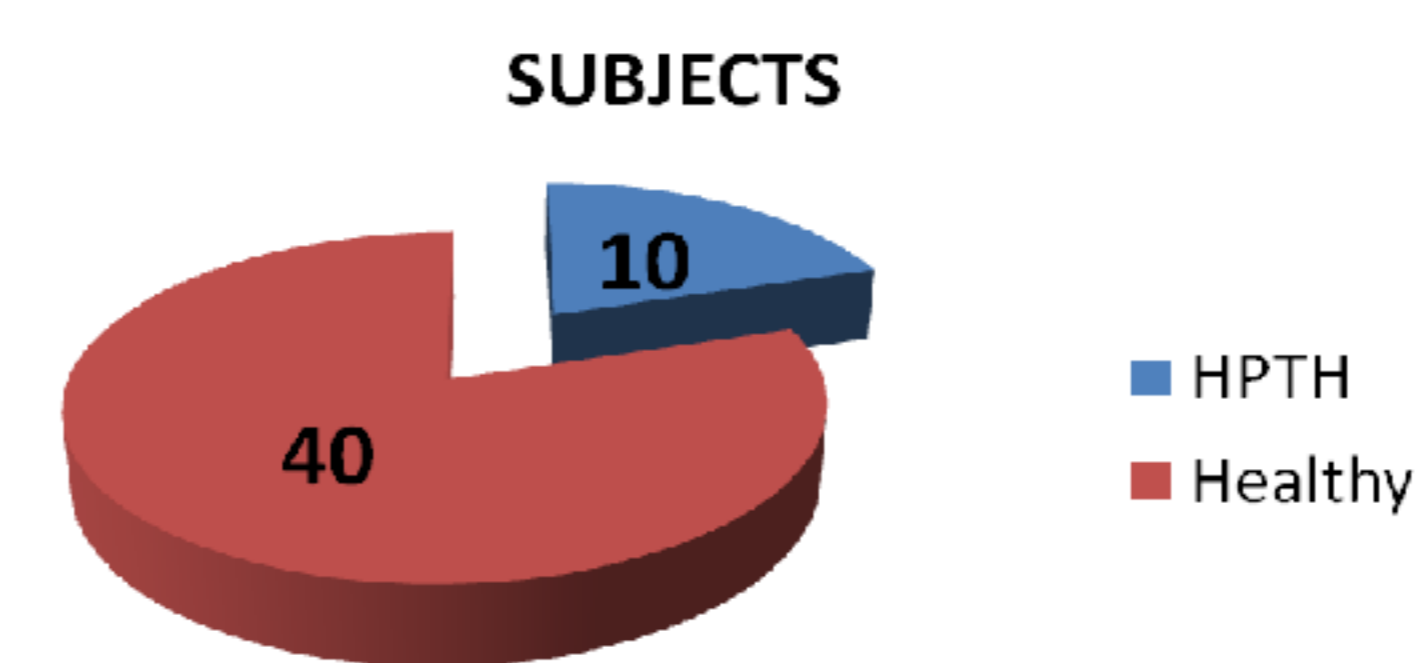
The aim of the study was to determine the values of the elasticity index (EI) measured by SWE in parathyroid gland adenomas and to compare with those of adjacent normal thyroid tissue.

METHODS

We studied 50 cases (F/M = 42/8), mean age 32.9±15.1 years:

- 10 with primary or tertiary hyperparathyroidism, diagnosed by specific tests
- 40 healthy volunteers.

In all the patients with hyperparathyroidism, parathyroid adenomas were detected by using ultrasound and at least another imaging technique. In six cases surgical removal of parathyroid adenomas was performed and the pathological results confirm the diagnosis.



For each parathyroid lesion two or three elastographic determinations (Fig.1) were performed and a mean value was calculated and expressed in kilopascals (kPa).

In healthy volunteers, thyroid parenchyma was evaluated, by performing 3 elastography determinations for each thyroid lobe (Fig.2). A mean value was calculated and expressed in kPa.

All the measurements were performed with an Aixplorer system (Supersonic Image Inc. France), using a linear high-resolution transducer 15-4 MHz.

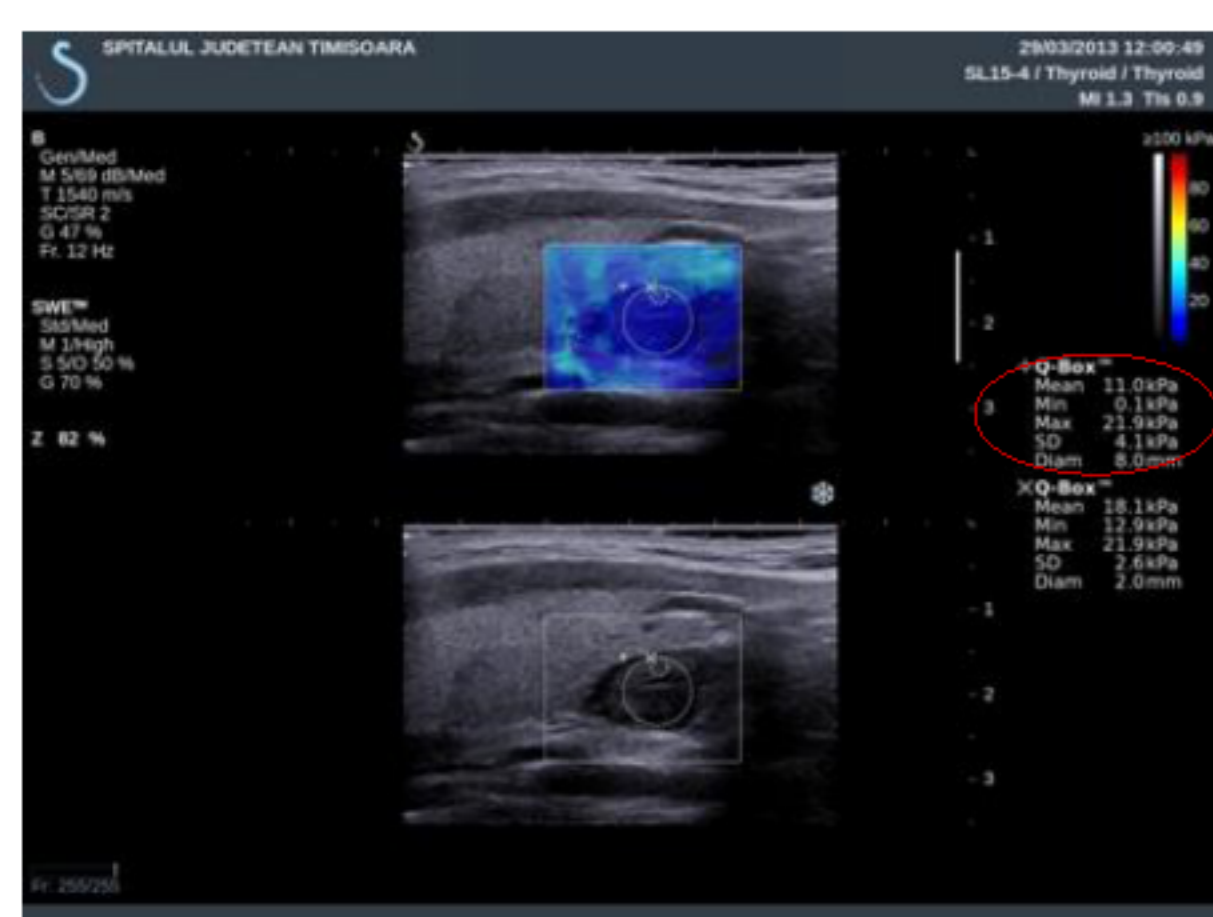


Fig.1:SWE of a parathyroid adenoma

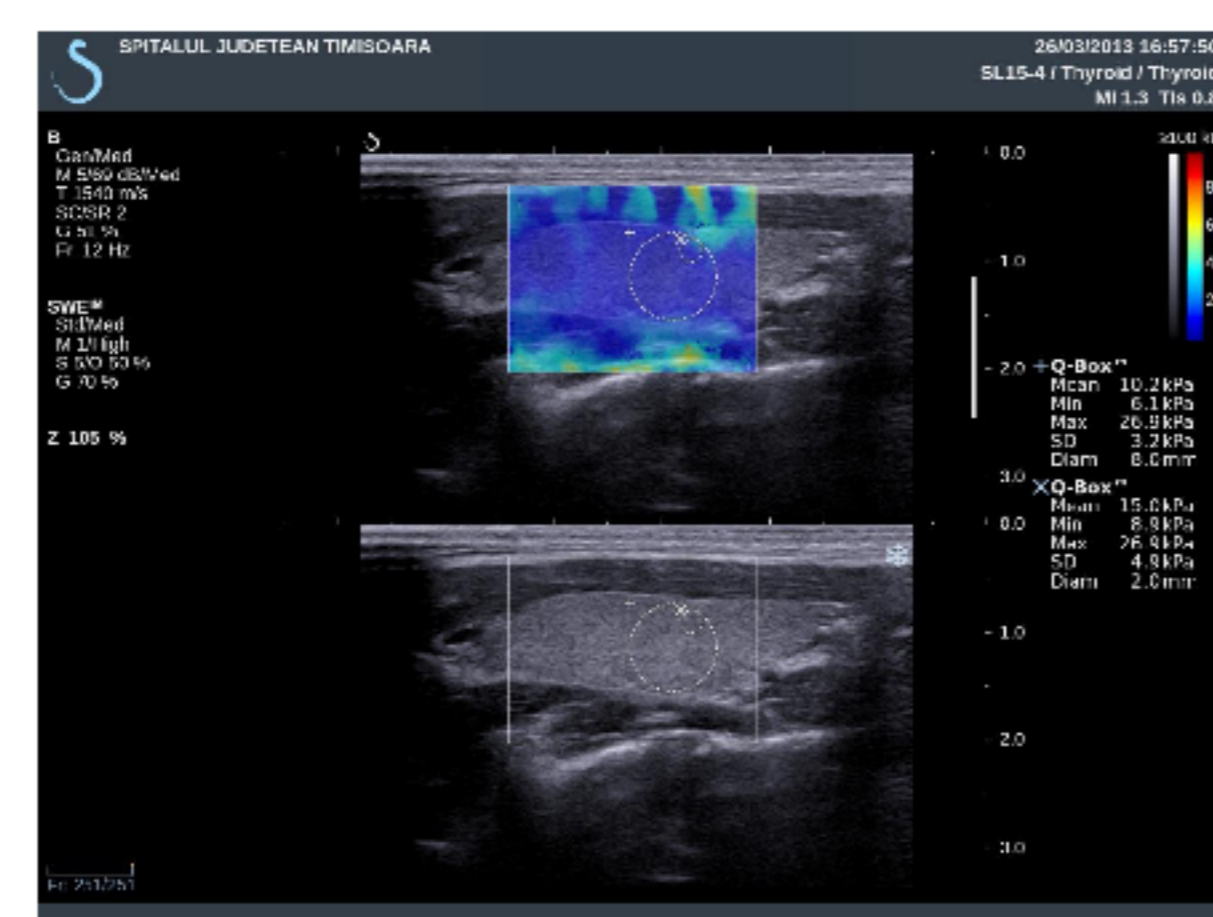


Fig.2: SWE of normal thyroid

RESULTS

In 10 patients with primary or tertiary hyperparathyroidism, 11 parathyroid adenomas were evaluated by SWE. The mean EI for parathyroid lesions was 9.2±4.8 kPa (4.2-18.2).

In healthy volunteers the mean EI was similar in the right and left thyroid 19.9±6.6 kPa vs. 19.3±6.6 kPa, p=0.69, respectively. The statistical analysis indicates that the mean EI assessed by SWE in parathyroid adenomas was significantly lower than in nearby normal thyroid parenchyma: 9.2±4.8 kPa vs. 19.6±6.2 kPa, p<0.0001 (tab.1).

Tab. 1: Mean EI in normal thyroid versus parathyroid adenoma

	RTL	LTL	Mean RTL-LTL	Parathyroid adenoma
EI (kPa)	19.9±6.6	19.3±6.6	19.6±6.2	9.2±4.8
p	NS (0.69)			p<0.0001

CONCLUSIONS

1. This new technique can evaluate the elasticity of parathyroid adenomas and a quantitatively result for EI could be obtained.
2. Our data indicate that the values for EI were significantly lower in parathyroid adenoma than in normal thyroid parenchyma.
3. This preliminary study indicates that the determination of EI by SWE might be a new method that can help in preoperative localization of parathyroid adenomas.

References

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