In vivo detection of malignant infiltration of cervical lymph nodes using backscatter coefficients

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Conclusion
Here we present the first report of in vivo assessment of lymph nodes for metastatic infiltration using BSCs. Our preliminary results suggest that is possible to discriminate between benign and malignant nodes using BSCs. More data is required in order to corroborate these findings.

Introduction
Sonographic evaluation is part of the workup of several solid tumors while lymph nodes characterization plays an important role in cancer staging or detecting local or distant recurrences.

Goal
In this work we evaluated non-invasively cervical lymph nodes using ultrasonic backscatter coefficients (BSCs).

Results
The median age was 51 years (range: 19-91) and 16 cases (72.7%) were female. Primary sites of tumors were thyroid (n=11), oral carcinoma (n=5), breast (n=2), breast and thyroid (n=2), Breast, thyroid and melanoma (n=1). One patient had a benign thyroid condition.

The values of relative average BSC for the malignant cases were higher than the ones for the benign cases (0.2730 +/- 0.4823 vs. 0.0689 +/- 0.0631). Statistically significant differences were observed between the relative BSC of the benign and malignant cases using a Wilcoxon test (p=0.02).

With a threshold of 0.154 we obtain a sensitivity of 77.8%, a specificity of 75% and a AUC of 0.806.

We are evaluating a larger cohort in order to validate our results.

Fig 1.- Relative average BSC value in benign and malignant case

Fig 2.- graph with the values obtained for all 22 patients

Fig 3.- ROC curve of the threshold selected.

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