LETTER TO THE EDITOR

Response to letter to the editor from Dr. Bernardi regarding suitability of residual vital ratio for prediction of local regrowth following radiofrequency ablation for benign thyroid nodules

We thank Dr. Bernardi et al. [1] for their comments and efforts on our work about the prediction of regrowth after radiofrequency ablation (RFA) for benign thyroid nodules. Since RFA has been considered as an alternative to surgery, the long-term efficacy has attracted research attention.

In our previous study, residual vital ratio (RVR) was determined to early predict nodule regrowth after RFA for benign thyroid nodules. It was the initial ratio of residual vital volume to the total volume after RFA. Because the total volume of nodule after ablation could be divided into the ablate volume and vital volume (Vv) [2], the equation of RVR were as follows: RVR = Vv/Vt × 100% = (Vt – Va)/Vt × 100%. Our results showed that RVR was the independent factor associated with regrowth by multivariate logistic regression analysis. The AUC for RVR to predict regrowth was 0.819 with a cutoff value of 44.5%. Dr. Bernardi et al. further evaluated RVR predictive value for clinical outcomes after five-year RFA. The results showed that RVR had a moderate accuracy in predicting technique inefficacy and a good accuracy in predicting retreatment, but no discriminative value for regrowth.

There were several reasons to explain the different results from two studies. The most important one was that the measurement methods of RVR in the two studies were different. In our study, Vt was measured by conventional US and Va by contrast-enhanced ultrasound (CEUS). After reading the study of Dr. Bernardi et al. [3], we found that only conventional US was used for the measurements. However, the margin between the ablated area and incomplete vital area was ill-defined or irregular on conventional US [4]. Schiaffino et al. [5] showed that CEUS had higher reproducibility and inter- and intra-observer agreement compared to conventional US in the assessment of Va measurement after RFA for benign thyroid nodules. Our recent study also observed similar results [6]. The results found that Va measured by conventional US was significantly larger than measured by CEUS. The intra- and inter-observer reliability and agreement between conventional US and CEUS in measuring Va decreased over the follow-up period. The best agreement was found at 1 month with a mean difference of 1.156±1.156 and LOA of 0.453 to 2.948. It means that compared with CEUS, the measurements of Va were overestimated by conventional US. Meanwhile, for about 95% of cases, the measurements by conventional US were between 0.453 and 2.948 times the measurements by CEUS, which was much larger than the clinical criteria (0.5–1.5) [7–10]. These results indicated that conventional US could be neither reliable nor provide equivalent results compared to CEUS in the measurement of Va. Because of the larger Va measured by conventional US, RVR could be underestimated. It could have an impact on the evaluation of regrowth and explain the different results from these two studies.

Second, we agree with Dr. Bernardi that the discrepancy could also be related to the heterogeneous follow-up length. Sim et al. [2] found that there were two peaks of nodule regrowth after ablation. First peak began at 12 months after ablation and tended to be prominent at 2 years, and the second one appeared later than 5 years. However, the follow-up period in our study was only 22.50±13.29 months, the value of RVR on the second peak of regrowth is further prospective investigation.

Third, both studies were respective, and the clinical characteristics were different. In their study [3], 66% of the nodules were nonfunctioning and 34% of the nodules were autonomously functioning. The nodule structure was solid in 44% of cases, predominantly solid in 35% and predominantly cystic in 21% of cases. However, in our study, the nodules were all nonfunctioning and structure was solid and predominantly solid nodules. No predominantly cystic nor autonomously functioning thyroid nodules were included.

In conclusion, accurate detection and measurements of the true volume was essential for successful evaluation [11]. Compared with conventional US, CEUS was a superior method for detection of microvasculature circulation dynamics and is useful for precise definition of the size and margins of the necrotic zone induced by thermal ablation [12,13]. For precise prediction of regrowth after RFA, CEUS needed be used for the measurement and calculation of RVR.

Disclosure statement
No potential conflict of interest was reported by the author(s).

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