Ultrasound thyroid gland volume estimation: a review

ABSTRACT

It is important to evaluate thyroid size before any thyroid surgical involvement to introduce the minimal invasive surgical procedures and the accuracy of the therapy dosage is directly based on the accuracy of thyroid volume estimation. This paper surveys the volume estimation of thyroid gland with Ultrasound (US). The techniques that have been used in the Ultrasound thyroid volume calculations have been discussed in addition to the data type, situations of application of each medical device with thyroid gland disorder or disease. Besides that, the comparison between the Ultrasound and some other medical devices that are used in the thyroid volume estimation has been made. We conclude by selecting several papers which have presented original ideas that: first, MRI and CT have the highest accuracy in the thyroid gland volume estimation but the Ultrasound still widely and robust procedure that are used for thyroid volume measurements in the routine clinical setting. Second, the automated calculation for the thyroid size improved the estimation results especially for the Ultrasound; third, there are no studies that applied these calculations on the large multinodular goiters because of the US probe foot pad limitation.

Keyword: CT scans; MRI; Scintigraphy; SPECT; Thyroid gland; Ultrasound