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**Reply:**

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**Reply:**

We thank Drs. Sepahdari and Harari for their interest in our article and for sharing their experience on thyroid parenchymal enhancement and the utility of noncontrast CT for parathyroid multiphase CT.<sup>1</sup>

We agree that enhancement characteristics of parathyroid lesions and normal structures on multiphase CT scan could vary depending on the timing of the contrast phases. In particular, the thyroid gland is a structure that can give rise to false-positive and false-negative results because it can have nodular components and can be avidly enhancing.

In our case series, the mean thyroid gland attenuation was lower in the arterial phase than in the venous phase, but in 1 of our patients, we also found that the thyroid gland attenuation in the arterial phase was greater than that in the venous phase. For this reason, we attempted to refine the criteria with the use of the relative enhancement washout percentage and tissue-arterial ratios. These indices account for the magnitude of the attenuation change between arterial and venous phases and tissue attenuation relative to carotid artery attenuation, respectively, both of which are higher for parathyroid lesions than for the normal thyroid gland. However, our study is limited by a small number of patients, and future validation of these indices with more subjects will be important.

We agree that the optimal parathyroid multiphase CT protocol is yet to be determined. This will depend on CT technical factors that

influence the speed of scanning as well as the patient's cardiovascular status. We are interested in Drs. Sepahdari and Harari's use of the noncontrast phase. If this phase has added value in certain cases, we offer a modified approach to our dual-phase protocol, in which the radiation dose could still be minimized. For patients with known multinodular thyroids, imaging could start with a noncontrast CT with the z-axis limited to coverage of the thyroid gland. In other patients, the radiologist could check the CT images while the patient is still in the CT scanner. If there is a multinodular thyroid or if enhancement of the thyroid is greater in the arterial than in the venous phase, the radiologist could request a very delayed-phase CT scan with the z-axis through the thyroid gland.

**Reference**

1. Gafton AR, Glastonbury CM, Eastwood JD, et al. **Parathyroid lesions: characterization with dual-phase arterial and venous enhanced CT of the neck.** *AJNR Am J Neuroradiol* 2012 Jan 12. [Epub ahead of print]

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