Maximizing Thallium Stress/Redistribution Scans

TO THE EDITOR: In an effort to maximize the utility of the thallium scan, the subject of the reinjection of thallium has become an issue of recent concern (1). The rationale of the reinjection procedure is the observation that a stress/reinjection comparison does a better job of identifying viable myocardium than a stress/redistribution scan.

Some authors propose performing stress/redistribution scans with reinjection of thallium in those patients with a fixed defect on the redistribution scan (2,3). The problem with this technique is that it involves a third set of images and is disruptive of the imaging schedule. Some laboratories prefer a 24-hr delayed imaging session, but this is also disruptive to a busy schedule as well as inconvenient for outpatients.

Some authors (4) propose a reinjection of thallium 20 min before the performance of the redistribution scan. The problem with this approach is the fact that a very tight stenosis of a coronary vessel (the type that causes ‘pseudo-fixed’ stress-induced defects) can cause defects on rest studies that ‘fill-in’ over time (5). Thus, some viable regions will still be considered as areas of myocardial scarring.

To avoid these problems we propose the following sequence:

1. Perform a stress thallium scan in the standard manner. Leave the injection line in the patient’s arm in place during the scanning procedure.
2. At the end of the stress images (about 35–40 min after the termination of exercise), inject the booster dose of thallium and remove the i.v. line.
3. Obtain a 4-hr redistribution scan later that day.

We find that this procedure gives us the maximum clinical information with a minimum disruption to the department’s function. As far as the patient is concerned, it does not even involve having an extra needle stick.

REFERENCES


REPLY: We wish to thank Drs. Makler, Schwartz, Shapiro, and Scheff for their concerns in the limited value of current technique of stress-delayed thallium scan for assessing tissue viability (1–3). Many scientists are now pursuing alternative methods for enhanced detection of “redistribution” in the ischemic myocardium. The 24-hr delayed scan (4) or reinjection thallium scan (5–9) have been proven to be useful for identifying additional ischemia which often fails to show redistribution on the routine thallium-201 scan.

The reinjection of thallium immediately after the stress scan seems to work well based on the concept of increasing plasma concentration of thallium, which may redistribute during post-exercise hyperemia (10). However, since majority of ischemic segments already show redistribution on the 3–4-hr delayed scan, it may be difficult to delete the delayed scan. At present, we think that reinjection may not be necessary when the redistribution is already observed on 3–4-hr delayed scan. Such a new technique seems to be valuable only when the routine scan shows a persistent defect, although the third set of images might be disruptive to the imaging schedule. Perhaps, we need more clinical information on the reinjection scan before eliminating the 3–4-hr delayed scan. We do hope that the clinical investigations of Dr. Makler et al. will demonstrate that their procedure will really enhance detection of redistribution in the ischemic myocardium and that these areas will be reversible in cardiac function after restoration of blood flow.

REFERENCES

8. Tamaki N, Ohtani H, Yonekura Y, et al. Significance of fill-in after thallium-201 reinjection following delayed imaging: comparison with re-

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