REPLY: We realize that many investigators are presently using the 180° data sampling technique for reconstruction of transaxial single photon emission computed tomographic (SPECT) thallium-201 (^{201}Tl) myocardial perfusion imaging and appreciate the comments of Dr. Rahimian et al. and Dr. Mena et al. The main arguments in their letters revolve around the following points which are discussed below together with our answers.

1. Data acquisition technique and count statistics (Rahimian et al. and Mena et al.).
2. Data processing and attenuation correction (Rahimian et al.).
3. Pixel size and color scale image display (Mena et al.).
4. Problems of early redistribution (Mena et al.).

Regarding Data Acquisition and Count Statistics

In order to utilize the same patient data for comparison of processing, it was necessary to delete 32 frames for the 180° studies from the original 64 frames of the 360° acquired data. These deleted frames were acquired from the right side of the chest and involved the least useful data because the heart is asymmetrically located in the left side of the chest. However, even with this shortcoming, the added frames contain enough information to correct the artifact and distortions in the reconstructed data when utilizing the 360° mode. We have shown that by utilizing extra time acquiring data from the right half of the thorax with 360° sampling, we improve image reconstruction by eliminating false positive defects and image distortion. Therefore, the criticism by Rahimian et al, regarding having only half the data acquisition time devoted for the 180° images seems to miss the central point of the paper.

In our study with the 180° acquisition, the counts collected from the myocardium are not reduced by 50% but are only 25% less. We do not understand why Mena et al. would see a drop of 70%, and their assumption that dividing these numbers by two would cause a further decrease in statistical accuracy is, of course, no more valid than assuming that multiplication by two would increase the statistical accuracy. Improvement of count statistics by giving 3 mCi instead of 2 mCi of ^{201}Tl as indicated by Mena et al. will not remove the artifacts seen in the 180° images shown in our studies because the artifacts are related to limited angular sampling and not related to count statistics as discussed in the article. Phantom reconstruction with high count rates (*3*) has shown that a high count collection cannot eliminate limited angle sampling artifacts. The numbers in the illustrations do not represent the actual counts per pixel. Not only are they a function of the reconstruction but also a function of image display (zoom expansion for photographic purposes causes a fourfold reduction in counts displayed).

Regarding Data Processing and Attenuation Correction

In the article, it is stated that the data processing between 180° and 360° reconstruction differs only in that the 180° images were obtained by arithmetically averaging the 32 frames against a theoretical matrix with zero counts while the 360° reconstructed images were obtained by arithmetically averaging the actual opposing 32 frames. Rahimian et al. indicated that this difference in processing causes a significant reduction in counts in the 180° images and produces a partial attenuation correction for the 360° images. We maintain that these effects are not the causes of image artifact and distortion seen in our results. The most likely explanation is the limited angular sampling of the 180° mode and is also related to the variability of the position of the heart axis to explain why some patients develop these artifacts and some do not.

As shown in the series performed with the Series A 180° orthogonal collection, the greater the asymmetry, the more frequent the artifacts and distortions observed. Series A was included as an educational device to show the difficulty of reconstructing correctly an asymmetric object with limited angular sampling as has been previously shown (*2-5*). The artifacts and distortions occurring in Series B have the same theoretical basis as Series A but are less obvious since symmetry is more often achieved.

Regarding Pixel Size and Color Scale Image Display

Since the false-positive perfusion abnormalities and image distortions have been verified in adjacent slices, it is impossible to attribute the observed artifacts to statistical causes because of pixel size and color scale as implied by Mena et al. In any event, it is unlikely that the cause of false-positive defects and image distortion are caused by lack of counts after some reasonable threshold has been attained.

Problems of Early Redistribution

We do not understand why Mena et al. brought up the problem of early redistribution regarding our studies. Early redistribution will cause false-negative thallium myocardial images not false-positive defects as shown in the 180° images in our study. Furthermore, there is no known data to indicate that early redistribution will cause image distortion. There is, however, sufficient data, including our study, that limited angular sampling will cause image artifact and distortion (*1-5*).

We, therefore, reiterate our conclusion that based on the results of our study, "there is unequivocal evidence that the 180 degree data sampling technique for back projection image reconstruction of transaxial SPECT 201-Tl myocardial imaging is not reliable and should be discouraged and abandoned in clinical practice and 360 degree data sampling is the technique of choice."

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Radioactive Iodine Uptake by Breasts

TO THE EDITOR: In the March issue of the *Journal of Nuclear Medicine*, Ramos-Gabatin and Pretorius state that ectopic thyroid tissue in the breasts, which produced hyperthyroidism several weeks postpartum has been described (*1*). The reference sited for this statement was the article "I-123 Breast Uptake in a Young Primipara with Postpartum Transient Thyrotoxicosis" by Duong et al. (*2*). In the article, a 22-yr-old female presented 3 wk postpartum with signs, symptoms, and laboratory findings of hyperthyroidism. Her 24-hr iodine-123 (^{123}I) thyroid uptake was less than 1%. Considerable accumulation of ^{123}I was localized in the patient's breasts. She was treated with propylthiouracil for 6 wk and became asymptomatic. At that time, her 24-hr ^{123}I uptake was normal at 23% and no accumulation of ^{123}I was noted in her breasts. The authors did not state that the patient's hyperthyroidism caused by or related to uptake of ^{123}I by her breasts nor was there any mention of ectopic thyroid tissue in the breasts.

We feel this patient most likely has subacute lymphocytic thyroiditis occurring in the postpartum period (*3*) accounting for her clinical findings of hyperthyroidism and the low 24-hour ^{123}I thyroid uptake. Furthermore, we do not concur as stated by Ramos-Gabatin and Pretorius that ectopic thyroid tissue in the breasts produced hyperthyroidism in this 3-wk postpartum patient.

Recently, we scanned a 26-yr-old woman who was 4 mo

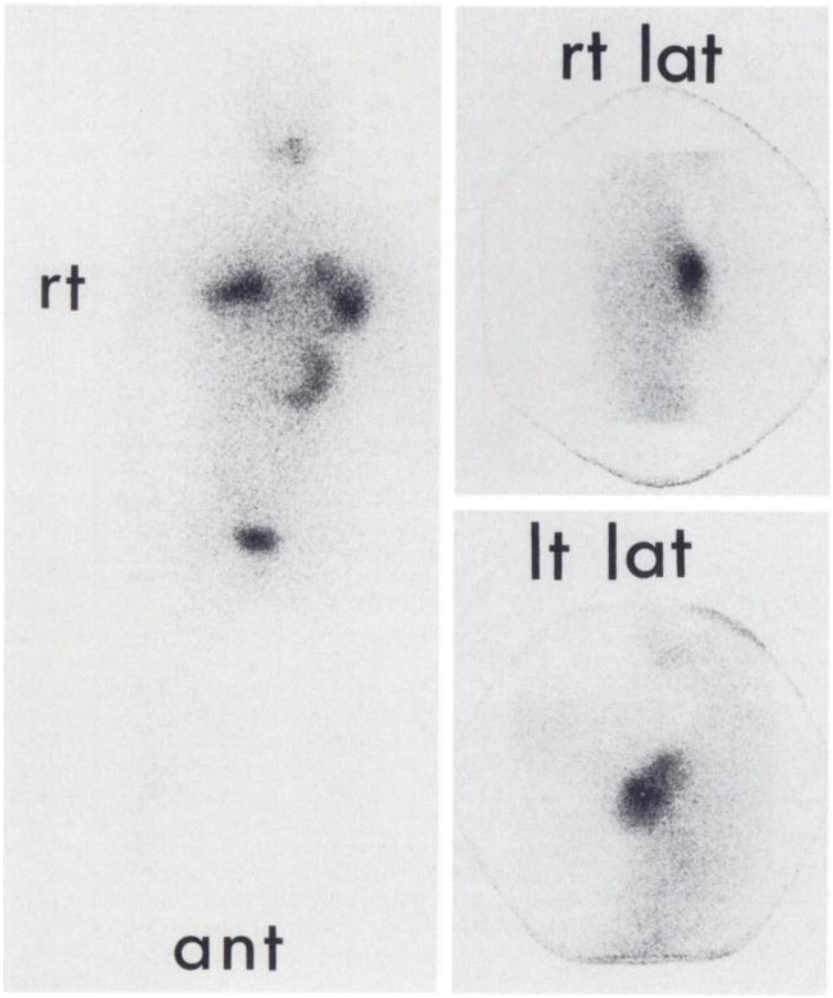

FIGURE 1
Marked accumulation of ^{131}I by lactating breasts