

# Maybe we don't need delayed parathyroid imaging!

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## OBJECTIVE

Our aim in the current study was to evaluate if delayed sestamibi parathyroid imaging can be avoided with the current practice of combined early/late sestamibi and pertechnetate imaging and SPECT-CT

## INTRODUCTION

Parathyroid imaging is performed for detection of parathyroid adenoma or hyperplasia. Imaging can be performed as “Dual Phase” by early/delayed  $^{99m}\text{Tc}$ -sestamibi or as “Dual isotope” using early/delayed  $^{99m}\text{Tc}$ -sestamibi and  $^{99m}\text{Tc}$ -pertechnetate. Current practice includes combined early/late sestamibi with pertechnetate and SPECT-CT. *We hypothesized that, since now we have sestamibi and pertechnetate along with SPECT -CT, it may no longer be necessary to perform delayed sestamibi imaging.*

## METHODS

Retrospectively, we identified 43 consecutive patients who had combined early/late sestamibi with pertechnetate and SPECT-CT studies for possible parathyroid adenoma. The studies were performed at our institution during 2013. An image review workflow was set up that only displayed the early sestamibi (at 15 minutes after injection) and pertechnetate planar and SPECT images. One reader scored all the studies on a scale of 1 to 5 as definitely normal, probably normal, equivocal, probably abnormal, and definitely abnormal. Regions scored were upper and lower, left and right. All studies were read a second time with another image review workflow that also showed the planar and SPECT images for delayed sestamibi at 90 minutes after injection.

### **Workflow-1**

- ❑ Mibi planar imaging: 5, 10 min
- ❑ 15 min Mibi SPECT-CT
- ❑ 90 min  $^{90}\text{TcO}_4$  Planar and SPECT-CT

### **Workflow-2**

- ❑ Mibi planar imaging: 5, 10, 60, 90 min
- ❑ 15 min Mibi SPECT-CT
- ❑ 90 min Mibi SPECT-CT
- ❑ 90 min  $^{90}\text{TcO}_4$  Planar and SPECT-CT

## RESULTS

Five patients were not evaluable because of missing images. In the 38 remaining patients, four sites were evaluated for each patient, for a total of 152 sites.

Disagreement in scores by 1 or more: 56 instances 36%
Disagreement in scores by 2 or more: 35 instances 23%

## CONCLUSIONS

The disagreement of scores by 2 or more would result in a change in interpretation from positive to negative. If this were to happen 23% of the time, it would be unacceptable. Although the number of subjects is low, the results are strongly suggestive that delayed imaging provides a significant contribution to the interpretation of parathyroid adenoma scintigraphy

## Take-Home Message

➤ ***Delayed Sestamibi imaging is essential for parathyroid adenoma imaging.***

## REFERENCE

Greenspan BS, Dillehay G, Intenzo C, Lavelly WC, O'Doherty M, Palestro CJ, Scheve W, Stabin MG, Sylvestros D, Tulchinsky M. SNM practice guideline for parathyroid scintigraphy 4.0. Journal of nuclear medicine technology. 2012 Jun 1;40(2):111-8.