

PRODUCTION OF CEREBROSPINAL FLUID LEAK ARTIFACT BY RESIDUAL <sup>99m</sup>Tc-PERTECHNETATE

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**Residual oropharyngeal <sup>99m</sup>Tc activity was detected on an <sup>111</sup>In-DTPA cisternogram creating the appearance of a CSF leak. This can be prevented by employing a spectrometer setting that encompasses only the higher principal photopeak of <sup>111</sup>In.**

Indium-111-DTPA has become widely accepted as a useful agent for cisternography. Satisfactory images may be obtained using either of the two principal photopeaks: 171 keV (89%) or 247 keV (94%). Dual spectrometer or "wide window" techniques have also been advocated to increase the useful photon yield per disintegration (1).

Since patients referred for cisternography may have been recently studied with <sup>99m</sup>Tc-pertechnetate brain scans, care must be taken to prevent residual technetium activity in the oropharynx from appearing on the <sup>111</sup>In images. Such activity could be misconstrued to represent a CSF leak. We have recently encountered such an artifact and hope that our experience will be helpful to others.

CASE REPORT

A 69-year-old woman was admitted for evaluation of tremor, mild memory loss, and occasional urinary incontinence. She gave no history of head trauma or meningitis and there were no signs to suggest a CSF leak.

Because of the possibility of normal-pressure hydrocephalus, an <sup>111</sup>In-DTPA cisternogram was performed on the day following a normal <sup>99m</sup>Tc-pertechnetate brain scan. Images obtained with a Pho/Gamma HP scintillation camera 4 hr after the lumbar injection of the radiopharmaceutical revealed activity in the oropharynx. This was initially considered to indicate leakage of cerebrospinal fluid (Fig. 1). Review of the technique employed for the scintiphotos disclosed that by error a 25% window centered at the 171-keV photopeak had been utilized. The patient was restudied using a 25% window centered at 247 keV and no oropharyngeal activity was detected. Serial images demonstrated normal progression of the radiopharmaceutical over the convexities. Subsequent workup was consistent with cerebral atrophy and she was discharged unimproved.



FIG. 1. Lateral 4-hr cisternogram showing activity in basal cisterns and oropharynx (arrow).

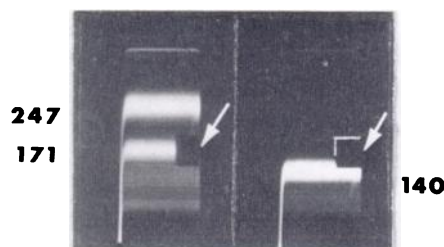


FIG. 2. Pho/Gamma HP scintillation camera spectral display of <sup>111</sup>In (left) and <sup>99m</sup>Tc (right). Note 25% window centered at 171-keV photopeak (arrow) overlaps upper portion of <sup>99m</sup>Tc spectrum.

DISCUSSION

With a 25% window setting centered at 171 keV, there is considerable overlap of the upper portion of the <sup>99m</sup>Tc spectrum (Fig. 2). This permits significant contribution by <sup>99m</sup>Tc to the total registered counts. Similar overlap may occur with "wide windows" designed to include both <sup>111</sup>In photopeaks. When performing <sup>111</sup>In-DTPA cisternograms on patients with residual technetium activity, it is imperative that spectrometer settings be employed that encompass only the 247-keV peak to prevent the production of confusing artifacts on the indium images.

REFERENCE

1. MATIN P, GOODWIN DA: Cerebrospinal fluid scanning with <sup>111</sup>In. *J Nucl Med* 12: 668-672, 1971

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