

# NMT Gadgetry

## Localization of Kidneys for Biopsy and Radiotherapy Portals

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A simple, quick, and accurate radionuclide method for the localization of the kidneys is described. The technique involves the use of two radio-opaque templates to create a cold outline around the imaged organ on the persistence oscilloscope of a scintillation camera.

Over the years several techniques have been used for organ localization for biopsy and radiotherapy portals. The use of radionuclides and the rectilinear scanner has been a standard procedure in most nuclear medicine departments. Recently Tully, et al (1) have reported the use of  $^{57}\text{Co}$ -microsources and the scintillation camera for obtaining such localization. The accuracy of various procedures for renal localization has also been discussed in the same article. A very satisfactory technique for organ delineation achieved by creating a cold outline on the persistence oscilloscope by using a flexible radio-opaque wire template over the imaged organ is described here.

### Methods and Materials

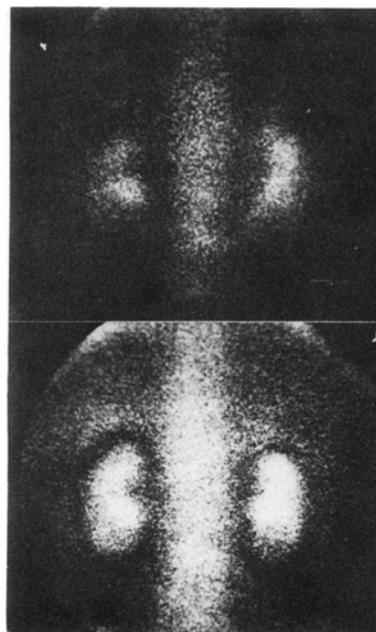
Immediately after the administration of 2–3 mCi of either  $^{99\text{m}}\text{Tc}$ -DTPA or  $^{99\text{m}}\text{Tc}$ -iron ascorbic acid or 10 mCi of  $^{99\text{m}}\text{Tc}$ -labeled pharmaceutical for bone imaging, the patient is placed under the detector in the prone position. If  $^{99\text{m}}\text{Tc}$ -iron ascorbic acid or the bone agent is used, the procedure could be carried out 2 hr after the administration if necessary.

Two thin strips of lead or soldering wire 3–4 mm in diameter and about 18 in. long are bent to the shape of the kidneys and placed over the back of the patient. While observing the persistence oscilloscope and electronically erasing the image formed as required, the wire frame is placed to circumscribe the image of the kidneys on the oscilloscope. A 1-min exposure is made with appro-

prate intensity setting, and the scintiphoto is examined for the position of the wire frame. Since the frame is very flexible, it can be shaped to coincide with the organ contour while still in place on the back of the patient, and the outline of the kidney can be drawn using it as a template. Figure 1 shows kidney localization immediately after the administration of 10 mCi of  $^{99\text{m}}\text{Tc}$ -diphosphonate.

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**FIG. 1.** Kidney scan showing cold area circumscribing kidneys due to wire frame shaped to organ contour.

## Summary

We previously had used the rectilinear scanner for kidney localization, which requires that the kidneys be scanned and the dot scan be used as a reference. This is often made difficult by faulty dot factor settings or size distortions because of excessively high counting rates attendant to the use of  $^{99m}\text{Tc}$ -labeled compounds. The technique de-

scribed here offers a quick and accurate method for the localization of kidneys and is now in routine use at our institution.

## Reference

1. Tully RJ, Stark VJ, Hoffer PB, et al: Renal scan prior to renal biopsy—a method for renal localization. *J Nucl Med* 13: 544-547, 1972