A HEAD-HOLDING DEVICE FOR IMPROVED BRAIN SCINTIGRAPHY

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Building a better mousetrap has always been one of the prime goals in driving civilized mankind toward the making of a "better" world. Men involved in nuclear medicine have had similar strivings; however, in this field, the building of a better head holder has only recently been such a goal. Head immobilization during brain imaging has usually been left to the ingenuity of the nuclear medicine technologist, who has responded by using adhesive tape and other makeshift devices. The need for such stabilization in producing accurate and reproducible scintigrams should not be underestimated. To produce accurate scintigrams, the head must be immobilized, because any motion will produce artifacts whose presence might not be recognized. Precise placement of the skull using standard radiographic positions is essential for adequate interpretation and comparison of scintigrams. With an immobilizing device it becomes possible to place the head accurately and to provide support for the patient. Our laboratory is now employing a relatively inexpensive and satisfactory head holder which, after simple modification, fits rigidly to the Nuclear-Chicago Pho/Gamma III (and II) Camera, and the Picker Dynacamera. Its specifica-

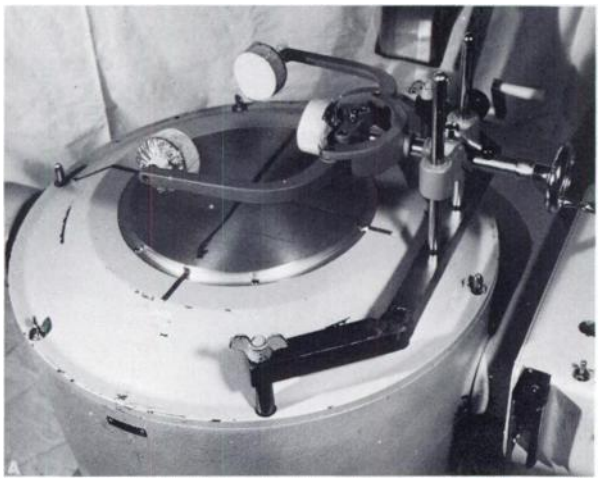

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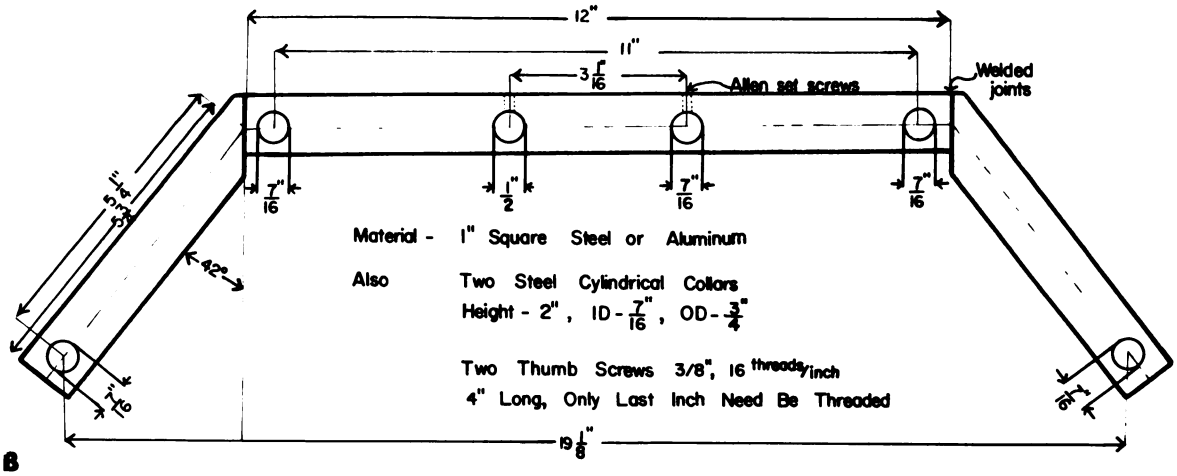
FIG. 1. A shows head holder mounted onto Nuclear Chicago Pho/Gamma III camera. B is line drawing of three-piece metal bar which adapts commercially available head holder to gamma camera.



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tions and advantages are described in this brief report.

The device is a radiographic head holder manufactured by the Frank Scholz X-Ray Corp. Its modification for use with the gamma camera merely involves removing the vacuum base and mounting the holder onto a three-piece steel bar which is approximately 1 in. square. The device is held to the gamma camera with two 4-in.-long thumb screws which are used in place of two of the four thumb screws usually used to hold the collimator in place. These screws support both the collimator and head holder. The steel bar is elevated 2 in. from the collimator by two steel cylindrical collars. The hand wheel opens and closes both padded jaws in unison. With the device fixed rigidly to the camera, when the jaws are closed, the patient's head is always brought to the midline of the crystal. Height of the jaws is adjustable to the face of the collimator (Figs. 1A and B).

The device has been used satisfactorily with patients sitting, supine, or prone, and with any position of the camera. Brain imaging of patients who are cooperative and relatively asymptomatic are usually performed with the patient sitting. In the past, it has been difficult for even the most cooperative patient to avoid slight head movements that produce motion artifacts on the scintigram. These movements have been all but eliminated with this device with no discomfort to the patient. It is no longer necessary for the technician to hold the patient's head during the exposure.

Use of the head-holding device by the technician is simple. The patient's head is positioned and held in place with one hand while the other hand turns the hand wheel and closes the jaws snugly. To prevent rotation of the head on anterior and posterior views, the distance from the collimator face and the external auditory meatus is measured on each side and determined to be equal. The anatomic base line is made perpendicular to the collimator face. On the lateral views, the distances from the collimator face to the external occipital protuberance, the bregma, and the nasion are made equal. These measurements assure nonrotated and reproducible scintigrams and are important in maintenance of quality control. Comparison with standard radiographic positions is thus simplified.

The device has also been used satisfactorily with comatose patients.

SUMMARY

Adequate head fixation during scintigraphy of the brain has been resolved with a commercially available, relatively inexpensive head holder, easily modified for use with commercially available gamma cameras.

Involuntary head movements in all but the most uncooperative patient have essentially been eliminated. The device assures that the head be maintained in the midline of the crystal and a few simple measurements assure that the head be held in a true lateral, anterior, or posterior position.

Since this head-holding device has been in use, our laboratory has produced noticeably improved brain scintigrams with less motion artifact and more reproducible and true projections.

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