

## A Technique for Scanning the Posterior Fossa<sup>1,2</sup>

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One of the most difficult areas to visualize in brain scanning is the posterior fossa and its adjacent areas. Other authors (1, 2) have reported relative inability to consistently visualize abnormalities in this region. It is the purpose of this paper to present a simple scanning technique which has proven of value to us in scanning this region of the brain.

### TECHNIQUE

Our routine scanning technique is as follows. Approximately one hour after oral or intravenous administration of 10 mc of Tc<sup>99m</sup> pertechnetate count rates of 6,000-10,000 cpm were usually obtained (Picker Magnascanner with 3 × 2" detector, 19 hole collimator, scanning speed of 60 cm/min, 0.25 cm line spacing index and small photo dot). We feel that this approach to scanning (use of narrow spacing and small photo dot) produces a better visual presentation. This is particularly true with the angled posterior.

The technique for visualization of the posterior fossa involves an approach similar to the "reverse Towne's" projection in radiography. The neck is slightly flexed with the chin somewhat depressed upon it. The posterior scan is performed with the detector angled 30 to 40 degrees cephalad, Figure 1. In scanning systems with a fixed probe, a similar view may be obtained by further flexion of the neck. (The important factor is the relative angle of the patient's head to the probe). The combination of probe angulation and slight neck flexion is more easily obtained and is generally more comfortable for the patient. In Figure 2, it is evident that the usual straight posterior is difficult to interpret below the line A due to radioisotope in the muscle, blood pools, etc. anteriorly. However, with a projection as shown with line B this difficulty may be circumvented. The posterior fossa is easily delineated with reference to the sinus confluens and the trans-

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verse sinus, Figure 3. In the angled view the sinus confluens is elevated with some indication of the occipital sinus bisecting the cerebellar hemispheres. The cerebellar hemispheres are outlined by increased radioactivity in the occipital musculature.

#### CASE MATERIAL

We utilize the angled posterior scan as an additional view when a lesion of the posterior fossa is suspected clinically or if a suspicious area is seen in this region on a routine projection. Utilizing this technique, we have had no proven false positives and one proven false negative (medulloblastoma). This technique has demonstrated three out of four proven tumors of the posterior fossa and diagnosed correctly a presumptive cerebellar hemorrhage.

Case 1, a 49-year-old male hypertensive on anticoagulant therapy with a left cerebellar hemorrhage diagnosed by clinical course is seen in Figures 4A and 4B. It can be seen that the straight posterior was questionably positive, but the area of abnormality is easily visualized on the angled view. Case 2 was a nine-year-old male with a pathologic diagnosis of midline medulloblastoma Figure 5A. The tumor is visualized below the sinus confluens when compared to a normal angled posterior (Fig. 5B). The straight posterior and laterals were both normal. Case 3 was a seven-year-old female with a pathologic diagnosis of a right

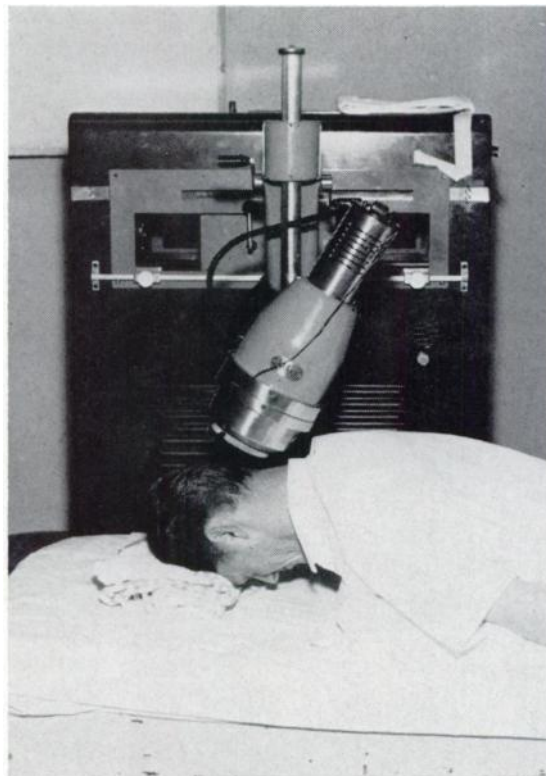


Fig. 1. Method of positioning patient and probe for angled (30° to 40°) posterior view.

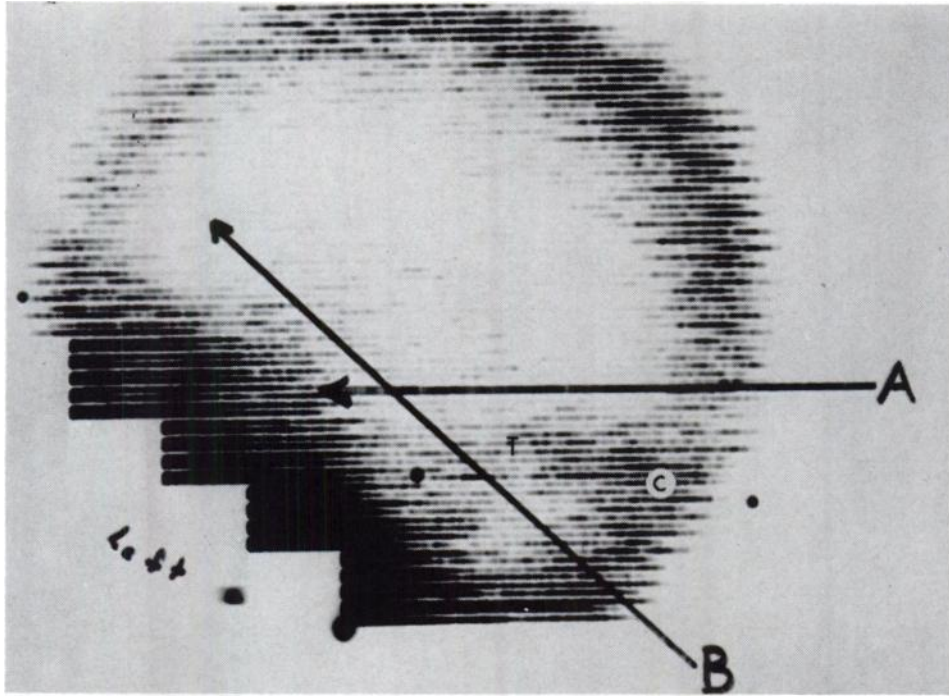


Fig. 2: Lateral scan illustrating interference anteriorly in visualization of posterior fossa with the straight posterior (projection A). The angled posterior (projection B) allows visualization of the posterior fossa. (C) sinus confluens. (T) transverse sinus.

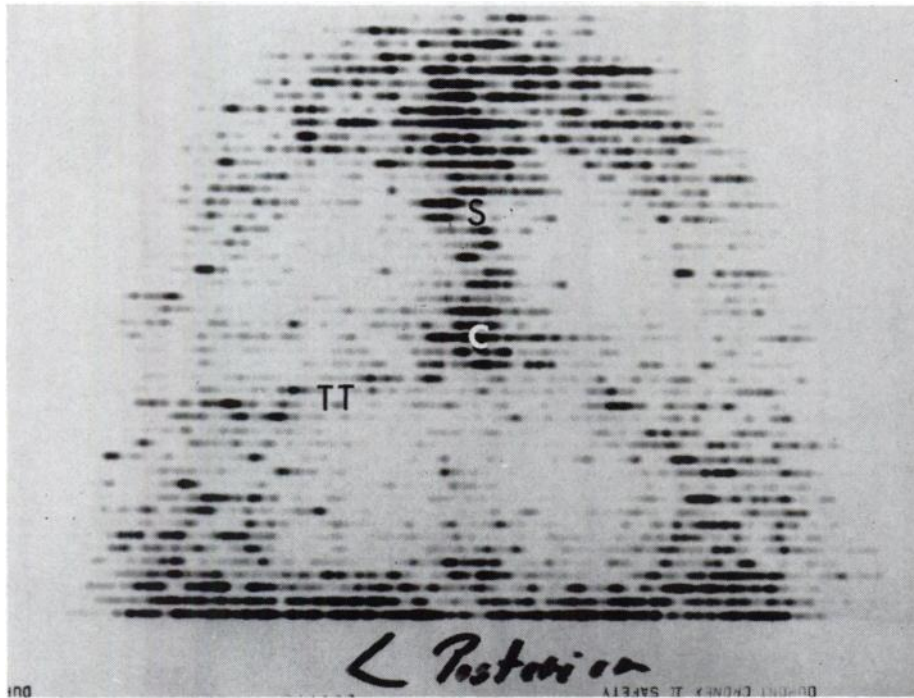


Fig. 3: Normal angled posterior. Note visualization of the posterior fossa and venous sinuses. (C) confluens. (S) sagittal sinus. (TT) transverse sinus.

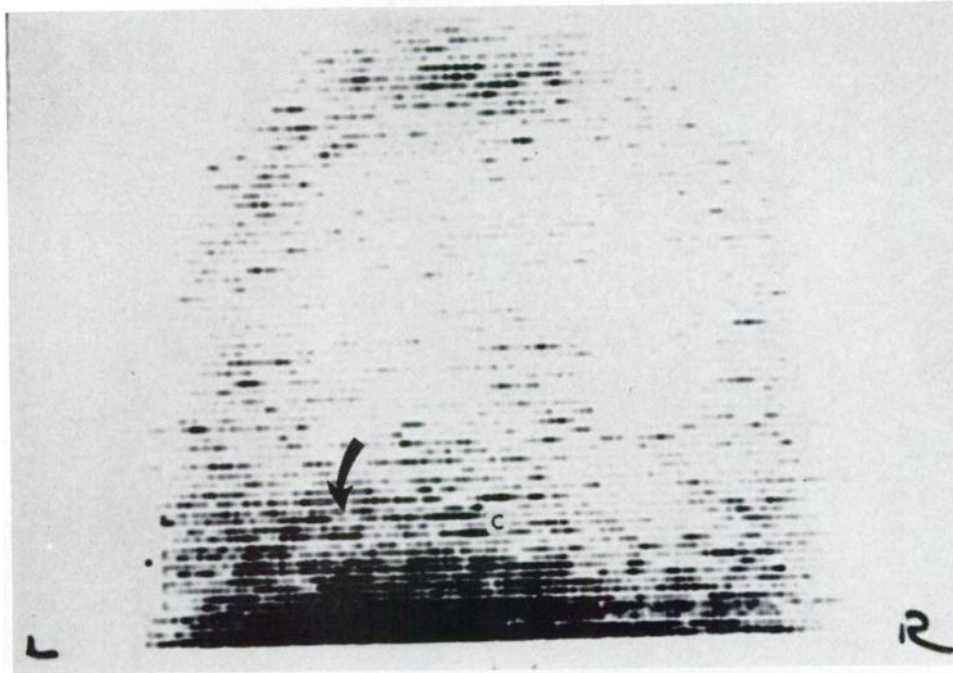


Fig. 4A: Straight posterior on case 1 (left cerebellar hemorrhage) questionably positive. (C) confluens.



Fig. 4B: Angled posterior on case 1 better illustrating the extent of the hemorrhage (C) confluens.

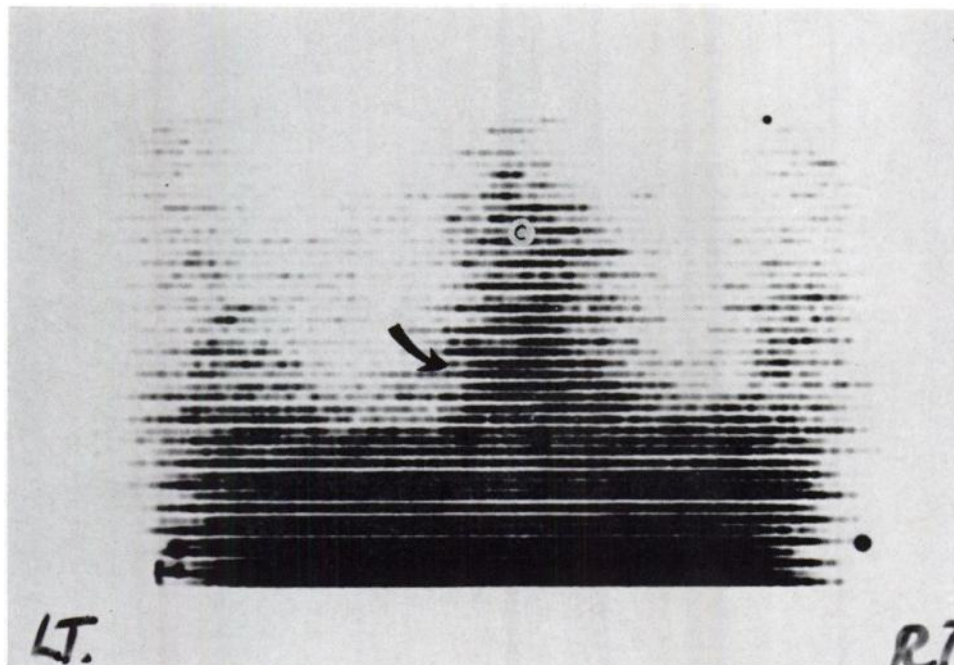


Fig. 5A: Angled posterior on case 2 (midline medulloblastoma) seen inferior to the sinus confluens (C).

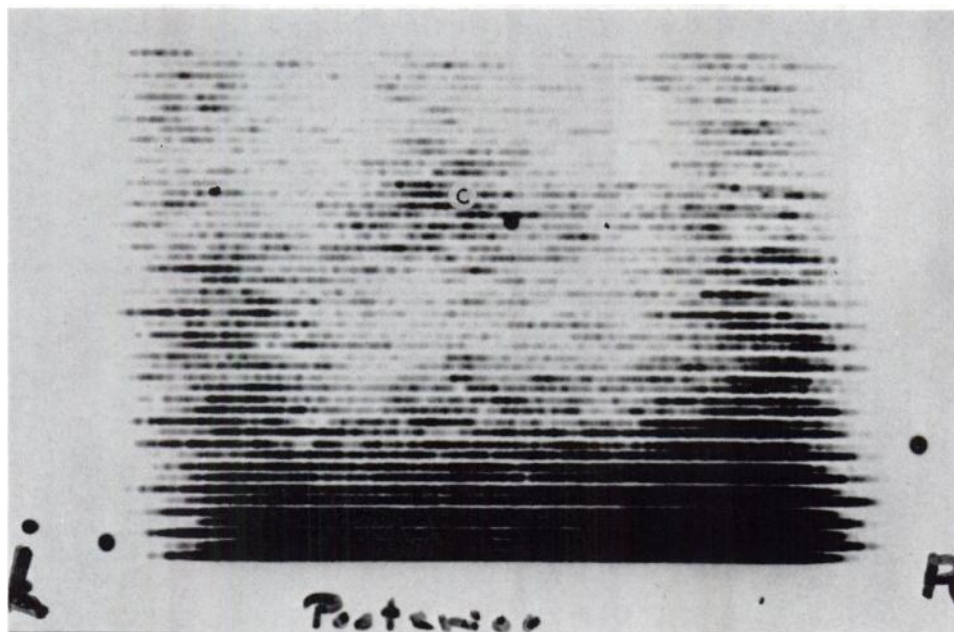


Fig. 5B: Normal angled posterior for comparison with positive scan of case 2. No activity seen inferior to the confluens (C).

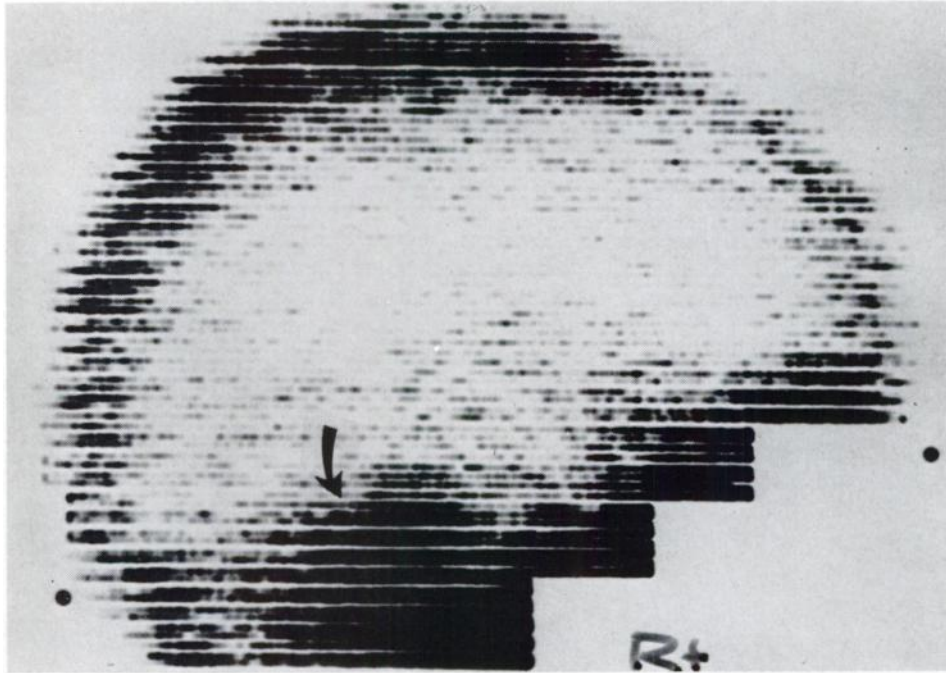


Fig. 6A: Lateral view of case 3 (right cystic astrocytoma of the posterior fossa).

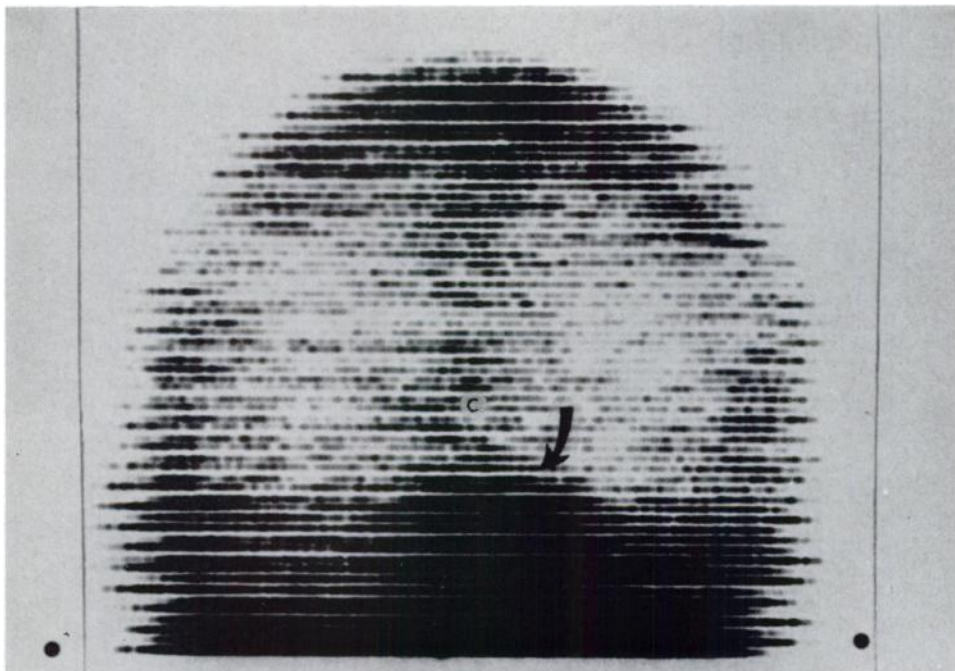


Fig. 6B: Angled posterior of case 3 showing the lesion on the right. (C) sinus confluens.

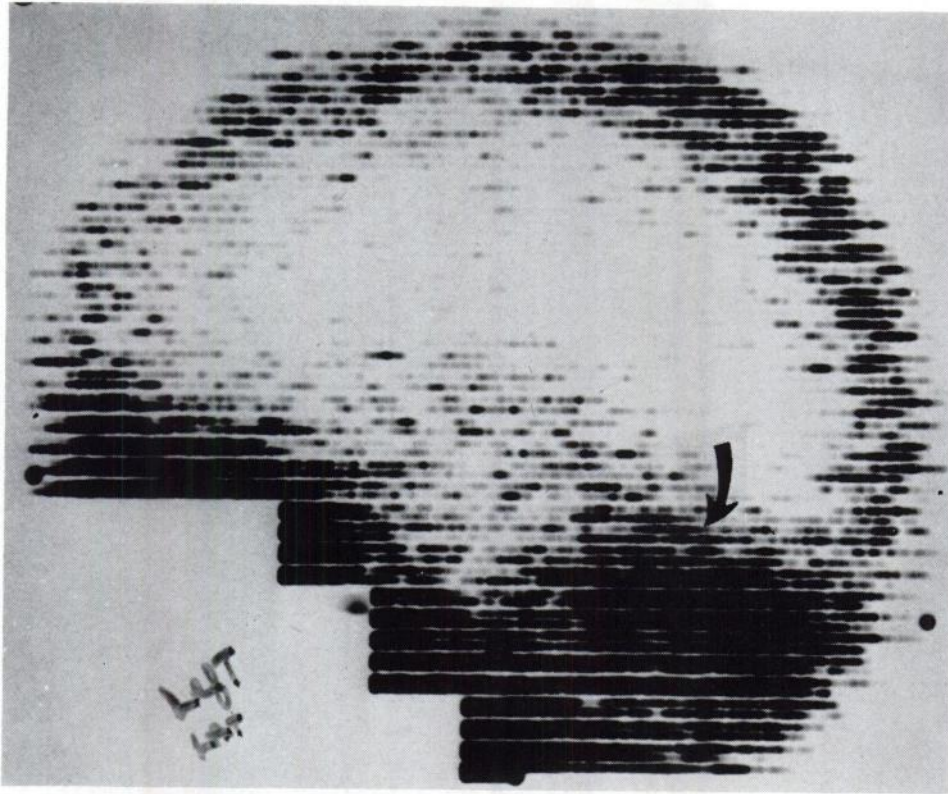


Fig. 7A: Lateral views of case 4 (left medulloblastoma).

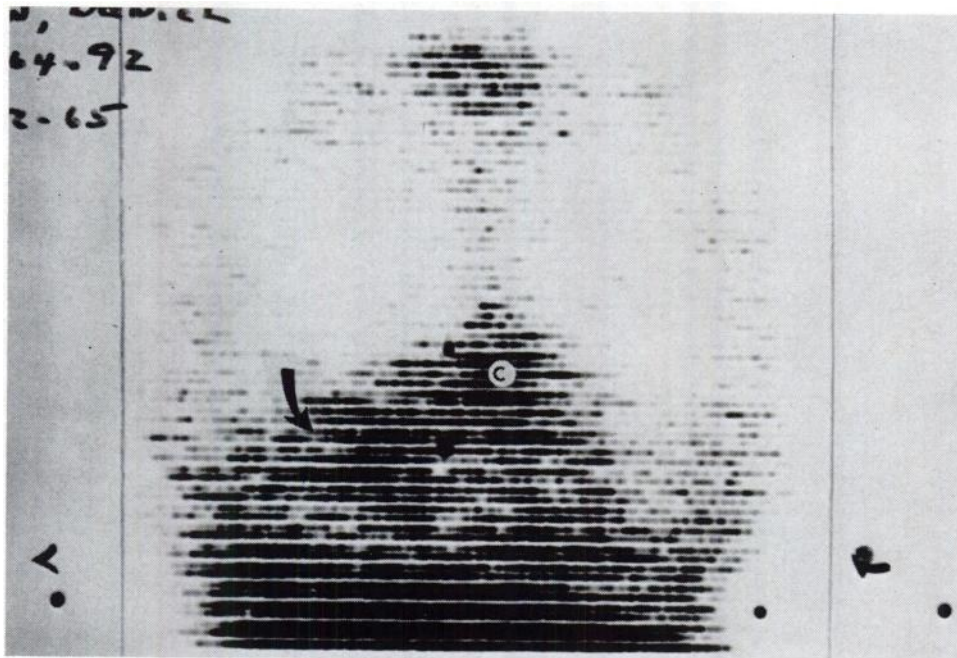


Fig. 7B: Angled posterior of case 4 showing extent of the lesion on the left. (C) sinus confluens.

cerebellar cystic astrocytoma (Fig. 6A & 6B). Case 4 was a 15-month-old male with a left medulloblastoma which is shown in the lateral and angled posterior views (Fig. 7A & 7B).

#### SUMMARY AND CONCLUSIONS

A technique for brain scanning the posterior fossa with an angled detector probe is presented. Normal and abnormal scans with pathologic diagnoses are shown to illustrate the value of the angled posterior projection.

#### BIBLIOGRAPHY

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- (2) SKLAROFF, D., POLAKOFF, P. P., LIN, P. M., CHARKES, N. D. Cerebral scanning with radioactive chloromerodrin (Neohydrin) *Neurology* 13:79-85, 1963.

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