TECHNICAL NOTE
A ROENTGEN TECHNIQUE FOR DEMONSTRATING RADIO-OPAQUE DEPOSITS IN BRAIN TISSUE SLICES*

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The use of roentgenograms of post mortem fixed brain tissue slices for demonstrating the extent, density, and distribution of radio-opaque material is not new.

As early as 1909 Fränkel (3) demonstrated the distribution of cerebral calcification by means of roentgen films of tissue slices. Although he apparently presented these films while reading his paper, no reproductions were ever printed, and no mention was made of the method used in taking the films. In 1931 Schiele (5), seemingly unaware of Fränkel’s report, used roentgen films of tissue slices in studying a case of hypoparathyroidism with bilateral cerebral calcification. He published a picture of a tissue slice, showing calcification of the dentate nucleus and indicated the simplicity and value of this method for demonstrating the exact location and distribution of calcium deposits in pathological specimens. In 1939 Eaton, Camp and Love (2) casually mentioned that they took a roentgenogram of a transverse section from the globi pallidi in the study of a case of symmetrical cerebral calcification. No illustration or details of the method were given. Ten years later, Löwenthal (4) published the roentgen film of a tissue slice showing intracerebral calcification. A footnote acknowledged the illustration to a paper by Chavany, van Bogaert, and Houdart (1) which was soon to appear. When it was published the following year, no illustration was shown nor were roentgenograms even mentioned.

Hence, although revived several times, this technique seems to sink back again into oblivion, and its use has certainly been anything but widespread. Consequently, its value and usefulness need renewed emphasis. Perhaps its limited employment is due to the fact that no concise report, giving exact instructions for taking roentgenograms of fixed brain tissue slices, is available in the literature.

Two recent cases, one of Sturge-Weber’s Disease and one of hypoparathyroidism following thyroidectomy, afforded the opportunity to study the distribution of extensive cerebral calcification.

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Fig. 1. Roentgenogram, demonstrating distribution of calcium deposits; hypoparathyroidism secondary to thyroidectomy.

Fig. 2. Roentgenogram, illustrating fine detail of varying density of deposits; case of Sturge-Weber's Disease.
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After formalin fixation, brain slices of .75 centimeter thickness were exposed for 100 milliampereseconds at 32 kilovolts at a distance of 76 centimeters (30 inches). A folder 20.3 x 25.4 centimeters (8 x 10 inch) no-screen method was used. The accompanying illustration demonstrates the fine detail which can be obtained and the clearness with which the distribution of calcium can be demonstrated.

DISCUSSION

It is obvious that any radio-opaque material, such as iron, silver, or calcium, can be demonstrated in this way. The demonstration of radio-opacity in a tissue is thus by no means diagnostic of calcification. Moreover, the early changes which often precede deposition of such material, for example the postulated colloidal albuminoid deposits which secondarily become impregnated with calcium in hypoparathyroidism, are not revealed. However, within these limitations, the method offers a rapid and easy means of demonstrating the distribution of radio-opaque substance in any pathological specimen.

REFERENCES