

tomography to apply for neurosurgical diagnosis and its diagnostic value has been discussed in several papers since 1967.

We have used Toshiba LGC-3 developed by Matsukawa and his coworkers in our 322 clinical cases in the period beginning August 1967 through October 1971. The exposure was accomplished utilizing a 3-looped superior epitrochoidal tube shift with the full-range X-ray exposure. This technique is called "roulette tomography." This method facilitated topographical diagnosis of intracranial calcification, deformity or destruction of the skull base and orbit, lesion of the sphenoidal air sinus and also measurement of the pituitary fossa. More frequently, combination of this technique with pneumoventriculography and/or pneumoencephalography or with so-called Conray (R)-ventriculography was really practicable and notably useful.

When there is obvious danger of herniation, continuous ventricular drainage was instituted in advance and intraventricular cerebrospinal fluid was replaced with air and, if necessary, air insufflation with spinal tapping was added. Roulette tomography was commonly performed in two dimensional planes, i.e. sagittal plane and frontal plane which is vertical to the imaginary plane including the superior margin of the orbit and external auditory meatus. Each frontal and sagittal section consisted of several films apperting 5 mm from each other passing through the presumable lesion.

In such a case as idiopathic epilepsy without suggesting morphological lesion, not only the outline of the brain stem but also the cross section of the vertebrabasilar artery, the trigeminal nerve root were clearly visualized without any interference from a blurring bony shadow. The normal and abnormal shape of the third, fourth ventricle, aqueduct of Sylvius as well as intraventricular tumorous lesion of various size were effectively delineated. Suprasellar, prepontine, pontine and cerebellopontine angle tumor of variety were clearly revealed themselves. This technique was also helpful to differentiate a nosurgical intracranial disease because of its easy practicability and of safty, usually without any positive contrast media, only with nontoxic air.

Attained roulette tomogram inevitably shows low contrast pattern but no blurring shadow. Therefore, when so-called harmonization technique was applied, its delineating ability might be remarkably multiplied.

Further advance seems to be expected with a little more modification of presently available apparatus from the neurosurgical standpoint.

A-3. Pneumautotomography for Third and Fourth Ventricle in Routine Pneumoencephalography without Special Instrument

Sumiyoshi TANABE and Yuji MIYAZAKI

Department Neurological Surgery, Sapporo Medical College and Hospital

Superimposition of the dense shadow caused by the petrous bone, mastoid air

cells and ear with the third ventricle, the aqueduct sylvii and the fourth ventricle makes a difficulty of interpretation of the findings of the latter group. The tomographic examination was needed to observe the ventricle system in the midline, particularly by means of tomography in sitting position with special designed x-ray machine. The authors paid attention to the method of autotomography developed by Vallebona and Ziedes des Plantes and authors emphasized that the autotomopneumoencephalography is very useful and simple method to demonstrate the midline ventricle system based on the authors' clinical experiences.

The principle of autotomopneumoencephalography is that the shadows of the structures situated away from the midline, such as the petrous bone was obscured and the midline ventricle system was outlined by keep immobile when the patient's head rotate with fixed position of x-ray film and x-ray tube.

The procedure is able to do in the sitting position and the fronto-occipital plane of the patient's head have to place parallel with x-ray film and the central x-ray beam direct to the fourth ventricle. 8 ml of air are infused and the first 6 ml of air should inject for approximately 30 seconds. The another 2 ml of air have to inject as rapidly as possible while the patient's head is rotated passively or actively. The range of rotation of the patient's head is usually 10 to 15° and it continues for whole duration of x-ray exposure.

The pneumoencephalogram of the midline ventricle system by this method was compared with fractional pneumoencephalogram and routine laminogram in each cases and revealed that the findings of autotomopneumoencephalogram was more clearly than the fractional pneumoencephalogram and the pneumolaminogram. No difference were there between the findings by this method and findings by the penumolaminogram taken by MIMAR 3 in sitting position.

The authors emphasized the following advantages of this method beside above mentioned points.

- 1) Autotomopneumoencephalography is able to do in the sitting position.
- 2) Autotomopneumoencephalography is able to do at the same time with routine pneumoencephalography.
- 3) Autotomopneumoencephalography is able to do in case of intracranial hypertension, because infused air is small amount.
- 4) Autotomopneumoencephalography needed only few minutes.