IRREGULARITIES IN THE CONTOUR OF THE ANTERIOR PART OF THE LATERAL VENTRICLE AS SHOWN IN AIR ENCEPHALOGRAMS

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Lindgren (1941) described deformities in the upper limit of the anterior horns of the lateral ventricles in the profile picture of air encephalograms, finding them 29 times in 635 air encephalograms. He is of the opinion that the deformities in these air encephalograms were without clinical significance and that they represented varieties of normal air encephalograms. Even earlier, Dyke and Davidoff described “ribbed deformities” of the lateral ventricles, which they found when hydrocephalic cerebral changes were present. De Lorimier, Moehring, and Hannan (1954) have described deformities in the anterior part of the lateral ventricles called “silver fork deformity”, which are very similar to the deformities which were described by Lindgren. De Lorimier and his colleagues think that “silver fork deformity” is an important diagnostic sign in cerebral tumours, especially in tumours of the corpus callosum.

We searched systematically for such deformities in 494 air encephalograms done in the last few years at this hospital. In the material we found the deformity of the anterior upper contour of the lateral ventricle in 76 cases, representing 15.5% of the total number. In view of this high percentage we feel it necessary to re-emphasize this problem, since, as far as we know, there are no new contributions to it in the professional literature since Lindgren’s paper in 1941. This seemed even more important to us, because we have found that a relatively large number of cases show deformity only in the form of simple flattening of the upper border of the anterior part of the lateral ventricle which is normally convex. Lindgren did not mention this type of deformity.

We assumed deformity to be present when found in the profile picture of a patient in the supine position, with the occipital region on the table. We did not take into consideration the deformity of the lateral ventricle in any other projection in spite of the fact that in some of these projections the deformity was found even more often. This deformity was usually found in other projections when a medium-sized hydrocephalic change of the ventricles was present.

In some cases the deformity was seen in the profile picture of the anterior horns, but it was not completely clear whether or not it might be due to an artefact produced by the superimposition of the air from the surface of the brain, or by the shadow of the coronary sutures. In view of this doubt we did not include such cases in our statistics. We were also careful to exclude deformities which might have been due to faulty radiological projections of skull deformities. In some traumatic cases we thought the deformity might have been due to the localized atrophy or scar deformity of the cerebral substance, and such cases were also excluded from our material.

In our material we distinguished three groups of deformities: (1) The deformity which appeared as a deep or shallow protrusion from the upper border into the ventricle. In this type of case a defect of the ventricular shadow was present (Fig. 1). (2) In the second group we included cases in which there were two or more such protrusions into the ventricle (Fig. 2). (3) We distinguished a third group in which the deformity appeared as a more or less clear flattening of the upper part of the anterior portion of the lateral ventricle (Fig. 3). Any of these three types of deformity might be found on one or both sides (Figs. 4 and 5).

Deformity was usually found in the anterior part of the lateral ventricle above and immediately adjacent to the foramina of Monro. The size of the protrusions in the first and second groups was up to ½ cm. in diameter. When the third group of deformity was present, that is the simple flattening of the upper border, it was one or more centimetres in length.
IRREGULARITIES OF ANTERIOR PART OF LATERAL VENTRICLE

Fig. 1.-Single protrusion into the ventricle (Type 1).

Fig. 2.-Multiple protrusions into the ventricle (Type 2).

Fig. 3.-Simple flattening of the upper contour of the anterior part of the lateral ventricle (Type 3).

Fig. 4.-Unilateral deformity of the anterior part of the lateral ventricle.

Fig. 5.-Bilateral deformity of the anterior part of the lateral ventricle.
We did not make any special radiological projections in search of these deformities. They are also sometimes seen in sagittal projection but we have not used sagittal projection in the present series as a means of finding the deformity.

Our material was of air encephalograms of unselected patients in the Neuropsychiatric Unit who were in hospital because of various neuropsychiatric diseases. Every type of neuropsychiatric case was represented in the series which showed these deformities in the air encephalograms: epilepsy, post-encephalitic states, traumatic encephalopathy, psychopathy, but when we analysed the clinical diagnoses in our series it was noticeable that the deformity was found usually in those diseases which are often associated with atrophic cerebral changes.

Looking at the 76 air encephalograms showing deformity, we found in about 70 there was some degree of hydrocephalus. When hydrocephalus was present, however, the deformity was found in the incipient and medium stages, never in the high-grade stages of hydrocephalus.

Lindgren (1941) gave evidence that these deformities are due to the protrusion of the radiation of the corpus callosum (which builds up the roof of the lateral ventricles) into the ventricles. The question arises, Why is the deformity seen in some cases and not in others? and, Is this the normal variety of the form of the anterior part of the lateral ventricle as Lindgren described it? We do not know why the deformity was more often or exclusively seen in hydrocephalic brain changes in our series. In our opinion it might be caused by the atrophy of the more sensitive cellular elements, the more resistant fibrous elements of the radiation of the corpus callosum then protruding into the lumen of the ventricle more markedly. We do not know why these deformities do not occur when severe hydrocephalus is present. We think that Lindgren’s opinion is acceptable that in high-grade hydrocephalic changes the pressure of cerebrospinal fluid from inside flattens the roof and in this way the deformities disappear.

Clinically, these deformities might have a double significance. First, they might be the symptom of a pathological process by itself, or secondly, they might be regarded as a normal variant of the outline of the lateral ventricle and important in the differential diagnosis of space-occupying cerebral lesions. Like Lindgren we had no normal control material as our air encephalographies were made in all kinds of cases for all possible clinical reasons. The deformities in our material had no special clinical significance. They often produced doubts about a space-occupying cerebral lesion, especially in the frontal parasagittal region. This doubt was especially reasonable when there was the third variety of deformity with the flattening of the upper border of the ventricle. In none of these doubtful cases did further clinical investigation prove cerebral tumour. We had less difficulty in differential diagnosis with tumours of the corpus callosum because the sagittal projection in such cases made the diagnosis clear. But we do emphasize that in our unit the number of expansive cerebral lesions is comparatively small. Perhaps this might account for the difference between our findings and those of Lindgren.

**Summary**

We think it necessary to point out again the deformities of the upper border of the anterior part of the lateral ventricle which were described by Lindgren in 1941. In our experience this deformity is more often seen than Lindgren found in his material.

The deformities are nearly always seen in cases of hydrocephalic ventricles, but the physiology of the development of these deformities is not clear. It seemed to us that they might be caused by the atrophy of cellular elements thus causing hydrocephalus, the more resistant fibrous elements of the radiation of the corpus callosum then protruding into the lumen of the ventricle more markedly.

The finding of the deformity of the upper contour of the anterior part of the lateral ventricle has no clinical significance but it should be recognized in the differential diagnosis in cerebral space-occupying lesions. It is especially important to recognize the simple flattening of the upper contour of the lateral ventricles because similar deformities may be seen in parasagittal expansions. Deformity of the upper contour of the anterior part of the lateral ventricle may be seen also in tumours of the corpus callosum but in these cases the sagittal picture makes the diagnosis clear.

**References**
