

plying the inner segment of each lenticular nucleus and resulting from carbon monoxide poisoning.

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## THE PERIMETRIC DEVIATIONS ACCOMPANYING PITUITARY LESIONS

(PRELIMINARY NOTE)

By Harvey Cushing, M.D., Boston

In a series of 104 examples of pituitary disease, the greater number accompanied by manifestations of tumor, due either to an enlargement of the hypophysis itself or to a superimposed lesion, changes in the fields of vision have been present in a large proportion of the cases.

Few physicians at the present time venture to make a diagnosis of an hypophysial lesion in the absence of a bitemporal hemianopsia; and it has been our experience that the majority of the neurologists and ophthalmologists through whose hands these patients have passed, have hesitated to make such a diagnosis—although there were obvious deviations from the normal in the perimetric outlines—for the reason that these deviations did not show the characteristic bitemporal defect with a more or less definitely vertical meridian separating blind from seeing fields.

As a matter of fact, in a considerable number of these cases the field defect has been an homonymous one; for when the enlarging gland bursts through its dural capsule it may extend into the interpeduncular space to one side of the chiasm rather than in a median posterior position.

The opportunity has been given in this series of cases, not only in many instances to follow the progressive changes in the visual fields as the defect advances, but also to follow the steps by which the normal peripheries become restored after a transphenoidal operation when partial removal of the growth has afforded relief from pressure.

These experiences have shown that in the majority of instances the defect advances in very characteristic fashion, usually beginning in the upper and outer temporal field and affecting color vision before vision for form. These minor changes are as characteristic of a retrochiasmal lesion as is the full-blown text-book picture of complete bitemporal hemianopsia. Furthermore the defect rarely advances with equal steps in the two eyes, and consequently for each individual eye it proves to be a matter of clinical convenience to divide the advancing process into stages, as follows:

*Stage I* shows merely a notch, often quadrantal, in the upper temporal field for color, though there may be in addition some slanting off of the form field. This is due to the fact that the ventral crossed fasciculus is affected by the pressure at an earlier stage than is the dorsal crossed fasciculus, the transmission of color impulses suffering earlier than the transmission of form impulses.

*Stage II.* In this stage a beginning quadrantal constriction in the form field follows upon the quadrantal defect for colors.

*Stage III.* Here color vision is more or less completely lost in the entire temporal field, the form constriction remaining practically quadrantal, with beginning encroachment upon the lower temporal field.

*Stage IV.* In this stage hemianopsia is complete for form and colors,

the macula still being spared by the otherwise practically vertical meridian.

*Stage V.* Hemianopsia remains complete for form and color, the macula now being included in the vertical meridian, there being in this stage often an actual complete macular blindness for colors.

*Stage VI.* Macular vision is lost for form as well as colors and the nasal field begins to shrink from the vertical meridian.

*Stage VII.* Color vision is entirely lost but a patch of vision for large objects remains, usually in the lower nasal quadrant.

*Stage VIII.* Blindness.

The least affected eye progresses in the meantime along the same route; for it cannot be emphasized too strongly that the process rarely advances with equal step in the two eyes. Indeed, commonly enough one eye may be completely blind, whereas the other may show a condition in Stage I, or may be with no observable change whatever.

Even after *Stage VIII* with blindness has been reached some vision may be regained by operative measures; which goes to show that the disturbance is brought about not only by an anatomical destruction of the fibers through a process of degeneration, but also by a physiological block to the transmission of impulses superimposed on the actual atrophic changes.

Though the prospect of a return of vision therefore is not utterly hopeless, even when blindness has supervened, it is nevertheless of great importance for us to recognize these evidences of chiasmal pressure in their early stages.

Pituitary disease, as must be emphasized, is a common malady, heretofore largely overlooked. One serious complication of the disorder is a so-called primary optic atrophy; and this is in many respects the most obvious of the neighborhood symptoms and one for which surgical measures are as definitely indicated as when dyspnea is produced by pressure against the trachea in cases of goitrous enlargement of the thyroid gland.

#### LESIONS OF THE HYPOPHYSIS AND OF THE UNCINATE REGION, WITH THE RECORDS, CLINICAL AND PATHOLOGICAL, OF A SERIES OF CASES

By Charles K. Mills, M.D., and Williams B. Cadwalader, M.D.

The paper was based on a series of eight cases, two of which had been previously shown at another society, both before operation. Of the eight cases one had presented uncinata without pituitary symptoms, necropsy in that case showing a large tumor involving the uncinata convolution, but extending into other regions of the cortex and subcortex. Of the other seven cases three presented both pituitary and uncinata phenomena of a decided character. In the other four uncinata symptoms were absent, pituitary phenomena being pronounced. These phenomena, however, were of a mixed character, illustrating dyspituitarism rather than either hypo- or hyperpituitarism. In one of the cases with decided uncinata symptoms no lesion of the temporal lobe was discoverable. In one case, in which the patient died after operation, a necropsy showed a tumor involving the infundibulum, pineal gland and adjoining structures. In three of the operated cases pathological conditions of the hypophysis were found at the operation and confirmed by microscopical examination of parts of the tissue removed. The authors are favorable to the fronto-