ANEURYSM OF THE INTERNAL CAROTID ARTERY ASSOCIATED WITH HYPOTHALAMIC FITS

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Aneurysms involving the circle of Willis are of common occurrence. In spite of their frequency, it is seldom that one attains unusual size, and it is a decidedly rare occasion when the history is found to extend over a period of 25 years. In Dandy's recently published work comprising 133 aneurysms, one case only covered a 22-year history, although there were several others in the age group of 10 to 17 years.3

The most unusual feature about the aneurysm described in the present report was not associated with its longevity or size, but rather concerned its influence on the hypothalamus. In Dandy's large series there was no case that in any way gave evidence of derangement of the functional activities of this center.2

CASE REPORT

A white 53-year-old veteran was admitted to the hospital on March 13, 1944. He complained of "severe headache over the right eye, trouble with his eyes, and fainting spells." The onset occurred 25 years previously in 1919 while serving with the armed forces in France. At that time he received a minor injury to his head, and, although dazed, was not knocked unconscious. He was able to recall a severe headache localized to the forehead and was of the opinion, but not certain, that he saw "double" with his left eye tending to turn out. At any event diplopia did occur, but whether instantly or over a period of time could not be stated definitely. Sometime later he experienced what he referred to as "fainting spells." These spells were characterized by a feeling of drowsiness which would rapidly increase in intensity, terminating in unconsciousness. There were no convulsive seizures associated with these episodes. The duration of the attacks varied from a few minutes to an hour or more.

At the beginning, these "attacks" were not particularly frequent, probably averaging four or five a year. The progression of symptoms was gradual. The headaches became more severe; the "fainting spells" more frequent; and the left eye pulled further to the left. The vision, particularly of the left eye, became greatly impaired. For the six months previous to admission the headaches were unusually intense and frequently shifted to both temporal regions. The "fainting spells" were longer in duration and occurred at least once a day.

The other relevant history was that of a penile lesion acquired while in the Service. It was not a proven chancre, and antiluetic therapy was never given.

Examination. The patient was a rather poorly developed and poorly nourished chronically ill white male. He was rational and oriented, but exhibited some evidence of memory impairment. His gait was normal, but he walked with obvious fatigue and his head was tilted and fixed to the right.

Fig. 1. Photograph of the patient on admission, which demonstrates the cranial nerve involvement.
Neurological examination showed the following positive findings: There was atrophy of the left disc, but fingers could be counted at several feet. The right disc was slightly blurred. The left 3rd and 4th cranial nerves were paralyzed (Fig. 1). There was complete sensory and partial motor impairment of the third division of the left 5th cranial nerve as well as a right central facial weakness. The peripheral reflexes were present and equal throughout, but on the hyperactive side. There were no pathological ones present. The Romberg test was negative. There was some clumsiness of the left arm, and left past pointing was fairly marked.

Laboratory tests, including the serology, were within the normal range. Spinal fluid examination was not done.

The x-ray report of the skull stated that there was an extensive calcification in a cyst wall occurring above and posterior to the sella, displacing the tip of the dorsum downward and forward, and situated chiefly to the left of the midline. Three distinct lobes of the cyst could be seen. The total width of the tumor mass was almost 6 cm. (Figs. 2 and 3). The x-ray opinion was craniopharyngioma.

Course. The patient's hospital course was marked by increasing severity of headache and "fainting spells." On observation these "spells" were characterized by an initial feeling of weakness and faintness. These aura were usually of sufficient length to enable him to reach his bed before unconsciousness intervened. This was accomplished without attracting attention, and other patients on the ward were totally unaware of the impending attack. He would simply climb on his bed, lie down quietly and, after carefully supporting his head, slip into deep unconsciousness. There was no evidence of motor involvement. Rapidly the color would become pale; the skin cold and clammy; the pulse weak and, at times, almost imperceptible. The blood pressure always fell from an average of 130/70 to 100 systolic or below, and on several instances it was necessary to give the patient supportive intravenous therapy.

At the termination of these periods of unconsciousness, the patient was frequently, but not always, confused. Within a few moments complete orientation returned and the only evident effect was the ever present headache.
Operation I. On March 22, 1944 a left frontal craniotomy was performed and, in the parasellar region, a solid tumor mass was encountered. It was tapped with difficulty with a fine needle but no cystic areas were disclosed. The chiasm was markedly taut and stretched.

Course. Postoperatively, the patient stated that he felt improved; whereas formerly he had had several "fainting spells" daily, he now remained free until April 1, 1944, when it was noticed by the ward nurse upon bathing him that he suddenly could not be aroused. His hands and feet became cold; his pulse thready and weak; respirations shallow; and his color pale. In approximately an hour, he began to respond. His temperature was reported as 96.2; pulse 70, but still weak.

During the next 3 weeks, there was definite general improvement; the headaches were less severe. He requested leave and on April 25, 1944 was allowed to go home for a few days.

He was readmitted May 12, 1944. The temperature was 98; pulse 80; respirations 16. He complained of increasingly severe headache and "fainting spells." His condition progressed and on May 24 he became drowsy. For the first time he vomited. There was clinical evidence of increasing intracranial pressure. During this period his blood pressure averaged 102/84.

Operation II. On May 25, 1944 the bone flap was elevated and a portion of the frontal lobe was removed for decompressive purposes. Further exploration of the tumor failed to reveal any cystic areas.

Course. A superficial wound infection became evident on the 5th day postoperatively. Meningitis followed associated with left-sided convulsions, and 10 days later he expired.

Necropsy. A large tumor mass, measuring $5.5 \times 4 \times 2$ cm., was present in the middle cranial fossa. The tumor was extra-cerebral, but deeply notched the hippocampus and uncus gyri of the left temporal lobe, and distorted all structures extending from the pons rostrally.
The cranial nerves from the 2nd to the 5th bilaterally were difficult to identify. The left 5th was incorporated in the capsule of the tumor mass as were the 3rd, 4th, and 6th nerves on the left. The basilar vessels were greatly changed with respect to anatomical relationship due to distortion by the tumor mass. Before removing the tumor, it was noted that the left internal carotid artery appeared to pass through its central portion. The optic chiasm was deformed, and the optic tract was thinned on the left. The tumor itself was solid, greyish-brown in color, encapsulated, and the external surface was irregularly nodular. There was moderate erosion of the left anterior clinoid process with involvement of the dorsum of the sella, and depression of both posterior clinoid processes. The pituitary gland was normal in size and appearance as was the floor of the sella.

Upon removal of the tumor, a large crater was exposed. It was bounded by the temporal lobes laterally, and all involved tissues were moulded and flattened against the sides. The floor of the depression was concave, and the hypothalamic region was compressed and distorted with the exception of the mamillary bodies which, although shifted backward in position, retained their normal gross form. The left cerebral peduncle was extensively gouged. The tuber cinereum and infundibulum were so smoothed out that it was difficult to distinguish them from the under-surface of the chiasm. The circle of Willis was unusual in that the left posterior communicating artery could not be identified and the right was thread-like in size. The left posterior cerebral artery was increased in size over that of the right side, although both were larger than normal. The circle of Willis was removed and its relationship with the tumor mass is shown in Fig. 4. On sectioning the tumor, concentric laminations of partially calcified thrombi of various ages were disclosed. The mass was solid, but some evidence of late hemorrhage in the form of a recent thrombus at the entrance to the sacculation was present.

The aneurysm came off the left internal carotid artery at a point where I would judge the left posterior communicating artery should arise. The opening was small and comparable with that of a normal posterior communicating artery. The lumen of the internal carotid was completely patent with no evidence of occlusion or obstruction throughout its entire length. Anatomically it was shown that adequate circulation through the circle of Willis had been maintained.
ANEURYSM OF THE INTERNAL CAROTID ARTERY

DISCUSSION

This case is noteworthy not only from the point of view of the aneurysm itself, but also from the clinical picture of hypothalamic involvement. In the first place, the fact that an aneurysm of such large size could have presented so few manifestations generally attributed to aneurysms of this location during its 25-year course seems quite remarkable. Undoubtedly, the many episodes of bleeding, as evidenced by the calcified laminations, finally resulting in spontaneous cure, as shown at postmortem examination, were caused by leakage rather than rupture. Certainly, there was no incident in the history compatible with or suggestive of a major rupture. Also the pulsatile characteristic must have terminated early or have been confined to a minimum; otherwise, more destructive changes in and about the sella would have occurred. Comparably, the amount of change in the sella was slight. The left anterior

FIG. 5. Coronal section, which shows the aneurysm in situ. A stick is placed in the left internal carotid artery, which was found to be completely patent. Marked distortion and flattening of the chiasm and hypothalamic region are evident. The ventricular system, with the exception of slight enlargement of the third ventricle, is within normal limits.

clinoid process was eroded and some general demineralization was noted throughout. These abnormalities together with forward bending of the posterior clinoid processes comprised the total structural change. The floor of the pituitary fossa was smooth and normal in shape.

The second unusual feature was the lack of development of obvious increased intracranial pressure associated with a lesion of this location and size until late in its course. A coronal section of the brain suggested a slight enlargement of the third ventricle with normal-sized lateral ventricles, as shown in Fig. 5.

From the clinical point of view, the most interesting feature was that described by the patient as his "fainting spells." The first time he was observed in one of these spells, his picture seemed indistinguishable from that of surgical shock. The color was poor; the body cold and clammy; the temperature subnormal; respirations shallow; the pulse weak and thready; and the systolic pressure below 100. On several other occasions, as mentioned above, intravenous support was given during these periods followed by definite improvement in his general condition. If left untreated, gradually he became conscious in conjunction with the return of his color, pulse, and blood pressure to the former levels.

Preoperatively, his mouth temperature consistently ranged between 97.2 and 97.4. The
day following his first operation, the temperature rose to 99.2, and then varied from 96.4 to 98 with a pulse averaging 70 and respirations 20. Only on the day of discharge did the temperature reach 98.6. There was this evidence of continuous disturbance of the heat-regulating center which became more pronounced during the periods of the hypothalamic fits. There was no clinical evidence of any anterior hypothalamic irritation or destruction. Although the tuber cinereum was crushed and thinned, functionally it remained intact and there was not the least indication of disturbance of fat, carbohydrate, or water metabolism. There were no emotional crises nor was there any evidence of mental instability. The patient’s emotions were always under control, and although his general picture was one of dullness and sleepiness, this was not borne out by his mental response.  

The question is raised by these episodes, which might be classified as a type of autonomic epilepsy, as to whether there is not a distinct relationship between surgical shock and elimination by depression alone of the posterior hypothalamic nuclei. It is conceivable that a vast flow of impulses instigated by trauma could be a sufficient reason for fatiguing these nuclei and thereby initiate the rapid development of shock.

CONCLUSION

The clinical and anatomical record of a large sacculated aneurysm of the internal carotid artery of 25 years’ duration has been presented. The clinical manifestations of associated hypothalamic fits have been discussed. The intimate relationship of the posterior hypothalamic nuclei and surgical shock has been suggested.

REFERENCES


PINEAL TERATOMA: REPORT OF CASE

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Tumors of the pineal body remain puzzling lesions from the standpoint of their origin, their true nature and proper designation, their potentialities for endocrine disturbance and their treatment. Teratomas have been invested with especial interest principally because of

* Since this paper was written, Dr. Ehni has entered the armed forces and is now Lieutenant (jg), Medical Corps, United States Naval Reserve.