A CASE OF FOCAL HEMORRHAGIC LESION OF THE PREPEDUNCLE (ANTERIOR CEREBELLAR PEDUNCLE.)¹

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HEMORRHAGES, or other lesions of the anterior cerebellar peduncles appear to be among the very rarest of pathological accidents. The following case is therefore considered as worthy of being reported.

R. W., American ; aged 37 ; married, and mother of one child ; was admitted to the Illinois Eastern Hospital for the Insane, Oct. 1, 1889, with a very meagre history. All that could be learned was that her parents were first cousins, that she had a rather worthless husband, had been always well prior to her confinement, that she had been insane for several years, cause unknown, and that for some time she had not changed in her mental or bodily condition. On admission she was in good physical condition, well nourished, no paralysis or motor disorder whatever, special senses and their organs apparently all normal, menstruation regular. The only abnormalities were a slight papular eruption (stated as "acne papulosa" by the examining physician) and a systolic cardiac murmur.

When she came under my care shortly after, there had been no change ; she was a typical untidy terminal dement, stupid and filthy in habits, even with close personal attention, but not violent or hard to control. She seemed to understand simple orders but seldom spoke, and then only to herself, and incoherently. There were no special troubles or

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peculiarities of speech and no decided indications of organic brain disease. Her appetite was generally somewhat excessive, and her general health very good.

On the morning of March 7, 1890, she rose as usual and ate a hearty breakfast and appeared quite in her usual health till 8.30 A.M., when she was suddenly taken with an attack of vomiting, something entirely unusual with her, and had at the same time a passage from the bowels, soiling her clothes, which was less out of the usual course of things, though in this instance it was probably involuntary. When she was taken to the bath-room, the attendants noticed that she walked with difficulty, and as they described it, "she acted as if she was dizzy." The vomiting was rather persistent, and she was put to bed and word sent shortly after to the medical office, though they did not report the case as at all urgent. She had to be helped by two attendants and they reported that in going upstairs to the dormitory, aside from herreeling she leaned rather heavily to the left.

Owing to other calls I did not see her till nearly eleven o'clock. She was then lying on her right side, her face was slightly flushed, eyes open, and pupils about normal, neither specially dilated or contracted, pulse a little accelerated, 80 or more, tongue lightly coated, temperature normal. She was conscious, could move herself in bed, and gave no signs of being in much pain, but had vomited freely since she was put to bed. There was nothing in her appearance or symptoms as she laid in bed to make me feel sure there was anything more the matter with her than some gastric irritative disorder, so I left a prescription suited to such, and gave instructions to have her watched and any change reported.

About the middle of the afternoon word was sent that the patient was worse, and I saw her again at 4 P. M. She was then lying with head strongly turned to the right and her body partially turned in that direction, a semi-lateral decubitus; her face was flushed, some frothy matter about the mouth, as if she had been vomiting or had had a convulsion (but the attendant had observed none), her eyes tightly closed, respiration rather rapid, 25 to the minute, and accompanied with mucous rattling in the throat and

coarse rales in the bronchial tubes. It occasionally slackened in its rate for a few seconds and then became rapid again, but this was not entirely regular. The temperature taken in the axilla was not above normal. Pulse fairly full and strong, ranging from 90 to 100. When the eyelids were forced apart the eyeballs were seen to be in rapid horizontal movement to and fro; the pupils were moderately contracted, their apparent diameter was about three or four millimetres. The left arm was rigidly flexed over the chest, the left leg was extended and lax, and though well protected by the bedding was decidedly cold to the touch, while the other parts of the body were warm. Sensation was apparently entirely lost in the left leg, and the plantar reflex could not be excited, while it was very marked in the right. There was no sign of facial paralysis. The appearance of the patient, aside from the tight closure of the eyes, which seemed a voluntary act, was that of complete coma.

The attendant stated that her condition had been gradually changing since dinner time (12.30 P. M.), when she had tried to eat but could keep nothing on her stomach. She had also soiled herself once since my former visit and her kidneys had acted freely.

From this time on the patient's condition grew progressively worse, the whole left side became paralyzed, the breathing stertorous and puffing, the decubitus dorsal, the pulse weaker and more rapid, the right side also paretic, and the urine and fæces were passed involuntarily. At 10 P. M. the head was still turned to the right, and the eyelids were closed, but not tightly, and the nystagmus was not observed. The left side, especially the leg, was palpably colder than the right, and this difference was very noticeable till the last hour or two of life, when it became somewhat less marked. The night watch reported that there seemed to be some fever before midnight, but the temperature was not taken. During the latter part of the night the patient lay quietly on her back, the limbs and muscles generally in a state of complete relaxation, and after 1 A. M. the respiration changed in character, became irregular, at times

rapid, and then almost intermitting altogether. She grew steadily weaker and died very quietly at 7 A. M. on the 8th.

Owing to failure to obtain the consent of friends, the autopsy was delayed till twenty-seven hours after death when it was finally concluded to make at least an examination of the brain. This was made by Dr. H. D. Valin and the writer, on the forenoon of March 9th, with the following results :

Body well nourished ; considerably discolored by sugillations. Nothing abnormal in the external integument of the cranium. On removal of the skull-cap the skull was found to be of about normal thickness, but the inner table was abnormally thin and porous looking. The dura was free over the whole convexity of the hemispheres, except at one or two points near the falx, and seemed dark in color and thinner than usual. Its vessels were also unduly noticeable and tortuous.

The vessels of the pia were enlarged and engorged, the arachnoid thickened and opaque in places. This was especially the case on the right hemisphere in the vicinity of the Sylvian fissure and over the superfrontal and part of the medifrontal gyri, from the apex of the frontal lobe to the central fissure. At the upper end of the pre-central gyrus, about a centimetre from the median fissure there was a nearly circular adhesion of ten or twelve millimetres in diameter in which the cortex tore away with the separation of the dura. The whole brain was in a very softened condition, so that it tore very badly in handling, and especially in its removal from the cranium, in spite of care, but aside from the post mortem injuries thus received there was nothing noticeably abnormal on the basilar surface of the brain.

No gross lesions were found in the hemispheres or basal ganglia, except a few dilated vessels and a small vacuole, about the size of a millet seed on the margin of the lenticula, and the anterior limb of the internal capsule. This was observed on one horizontal section about the level of the aula. The ventricles were rather pale, and I could not say *largely* distended. The pons, medulla and crura, though

badly softened and with some of their minuter gross anatomy obscured from this cause, showed no macroscopic lesions, and the same was the case with the cerebellum, which also appeared to be less softened than the other intracranial organs.

On the ventral aspect of the right prepeduncle, where it bends to form the roof of the fourth ventricle, there was a very noticeable hemorrhagic extravasation, very dark, almost black in color, roughly quadrate in its outline, seven or eight millimetres (estimated) in its longest (caudo-cephalad) diameter, and about or nearly six millimetres transversely. Its mesal border closely approached the valvular margin of the peduncle but did not encroach upon it. Laterally the borders were well defined and straight, but caudad and cephalad it presented a ragged outline as if the blood had dissected its way irregularly among the fibres. There was no escape of blood into the ventricle and the lesion did not extend deeply into the tissues; the dorsal fibres of the peduncle were not involved. The right prepeduncle also showed one or two minute hemorrhagic spots on the ventral surface. There was no discoverable abnormality in either of the other cerebellar peduncles.

The brain, as a whole, without the dura, weighed forty-three ounces. The convolutions seemed to be of the usual type in arrangement. The brain drained very thoroughly in its removal from the skull, and no accurate measurement was made of the amount of sub-dural fluid; it was estimated however, to be rather in excess of the normal.²

In this case we have a capillary hemorrhage, involving only the ventral portion of the prepeduncle causing sudden disturbances of equilibrium and vomiting with, possibly, paresis on the opposite side of the body, if that was indicated by the statement of the attendants that the patient leaned heavily on the person supporting her on the left. The mental condition of the patient obscured many of the symptoms and nothing could be learned as to whether she

² I might state here, in addition that there was a very fluid condition of the blood generally; coagulation appeared to have been delayed or prevented.

suffered from headache, or other discomfort. It is probable indeed that her sensibility was generally blunted, and that she did not suffer pain as a normal individual would. There was no loss of consciousness for at least five hours after the first attack ; but, while there was evidence, or appearance rather, of some discomfort on the part of the patient there were no signs of any very severe pain or suffering.

The disturbance of equilibrium is altogether in accord with what is, I think, as much as any other, the accepted theory of the functions of the prepuduncle, viz., that it contains the efferent fibres from the cerebellum, conveying to the hemispheres the impulses requisite for the finer co-ordinations. The statement of Stilling³ that it alone, of the three cerebellar peduncles, contains intra- and extra-ciliary and hemispherical fibres of the cerebellum, would suggest that possibly the functions of this part are more comprehensive than those of the others. However this may be, and assuming the possibility that it may have motor relations, indirect or otherwise, any contra-lateral paresis, occurring in the beginning of the attack, from a lesion limited to the prepuduncle, is not easily explained on the supposition that the decussation of its fibres in the commissure in the pons is complete. The apparent paresis in this case would therefore seem to point to a partial decussation of the fibres, such as is stated to exist by Marchi,⁴ and which is admitted with a query by Spitzka.⁵

The lateral decubitus on the side of the lesion, and the drawing of the head to the right noticed in the beginning of the attack and lasting till the coma and relaxation had become general, are noteworthy since this has been described by Curschmann⁶ as a characteristic symptom of injuries of the prepuduncle. It was not as lasting in this case as in the one described by him and no attempt was made to

³ Quoted by Wernicke, *Lehrb. d. Gehirnr.*, I., 135.

⁴ *Gaz. degli Ospitali*, No. 67, 1886. *Jour. of Nerv. and Ment. Disease*, 1886, p. 719.

⁵ *Ref. Handb. of Med. Sciences*, viii., p. 186.

⁶ *Deutsch. Arch. f. Klin. Med.*, x'i., 3 and 4, 1873. *Schmidt Jhrb.*, 162, p. 14.

alter the position to see if it would be reassumed, as was the case with his patient. The specially characteristic symptoms of lesion of the prepeduncle cannot be determined from clinical and pathological observations, as all of these in medical literature are complicated with involvement of other parts, but this deduction of Curschmann's from physiological experimentation, is not altogether unsupported by the present case. In this connection also, the rigidity of the arm observed later on recalls the experiments of Luciani on dogs, in which he observed after extirpation of the cerebellum a chronic contraction of the anterior limb.

The later appearing symptoms, the general relaxation and paralysis, and the coma, etc., preceding death were attributed during life to either an increasing clot causing pressure in the region of the fourth ventricle or to extensive ventricular effusion. The first of these did not exist, but I am inclined to think there was some abnormal intra-ventricular pressure. There was no obvious mechanical cause for this, and the effusion must have been due to a secondary irritative action induced in some way.

The cortical appearances of the hemispheres require mention here as they complicate the case to some extent. The conditions were not dissimilar to those met with in general paralysis, though there is generally a more recent and active meningitis in the latter, but there had never during life been observed anything pointing to such a diagnosis, either in the bodily or the mental symptoms. On the other hand, very similar appearances are occasionally met with in the autopsies of old terminal dements, or those who have been considered such for many years. It is not an impossible supposition that the brain was generally in such a condition that a congestive apoplectiform attack might have been excited by a sudden shock or injury of an important organ of the lower brain. I cannot think, however, if the cortical lesions played any part in the production of the symptoms observed in this case, that it was other than a secondary one.