Disturbances of Micturition and Defaecation due to Aneurysms of Anterior Communicating or Anterior Cerebral Arteries

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It was shown by Andrew and Nathan in a previous paper that lesions of a medial anterior region of the frontal lobes cause disturbances of micturition and less often of defaecation. The disorder consists of frequency and urgency of micturition, perhaps leading to incontinence. The patient has a reduced awareness of all vesical events; the sensation giving rise to the desire to micturate is diminished or absent, and the sensation that micturition is imminent may also be diminished or lost. All sensations associated with micturition may be lacking. The bladder empties when it contains less than the normal amount of urine, so that its functional capacity becomes reduced. There is also a partial or complete impairment of the ability to suppress the micturition reflex or to inhibit it once it has begun. Sometimes there is the same disorder of defaecation, although this is less common and less severe. A lesion in the same region of the brain sometimes causes retention of urine, associated with the same loss of awareness. The location of the lesion causing these disturbances was shown to be that region of the superior frontal gyrus where areas FB and FC overlap; its lateral extent is a little lateral to the tip of the lateral ventricles. The region includes the parts of the frontal lobe deep to this region of cortex and involves some of area LA of the anterior cingulate area. This region of the brain is shown in Fig. 1, a, b, and c.

The purpose of the present paper is to present a group of cases, showing that disturbances of micturition and defaecation can occur with aneurysms affecting the region where the rostral part of the diencephalon meets the telencephalon; to correlate these lesions with our present knowledge of the anatomy of this part of the brain; to suggest a relationship between the two parts of the brain lesions which cause the same clinical state; and to draw attention to these disturbances as localising symptoms and signs of lesions in these parts of the brain.

Case Reports

Case 1. Mrs. M.S. Two days before admission to hospital this 55-year-old woman suddenly developed severe headache which was followed by vomiting and then drowsiness. A lumbar puncture confirmed the diagnosis of spontaneous subarachnoid haemorrhage. On admission to the Neurosurgical Centre, the patient was alert and orientated; there was hesitancy in naming objects; the tendon reflexes of the right limbs were exaggerated, and both plantar responses were normal. Carotid angiography showed an aneurysm projecting forwards from the anterior communicating artery (Fig. 2).

On the fourth day after the haemorrhage, a right-sided frontotemporal craniotomy was performed under hypothermia. The frontal lobe was elevated, and a sub-pial resection of the grey matter of part of the gyrus rectus was carried out above the optic foramen. The aneurysm came into view, and its neck was clipped satisfactorily.

After this operation the patient regained consciousness within an hour. She was very slightly drowsy for 3 days, and then became normally alert. There was no change in the neurological signs.

The patient was completely incontinent of urine for 14 days after this operation. She was much distressed by this incontinence as she knew that it was delaying her return home. She stated that she did not know that her bladder was full until micturition was imminent, and then she was unable to hold urine for more than a minute. She could micturate normally and residual urine was no more than a few ml. Normal bladder sensation gradually returned, and with it, normal control.

Case 2. Mrs. C.M. We report this case through the kindness of Mr. Valentine Logue. This 46-
year-old woman had already had 3 minor episodes of spontaneous subarachnoid haemorrhage due to rupture of an aneurysm of the anterior communicating artery. Bilateral carotid angiography showed that the aneurysm filled only from the right carotid injection; as there was no anomaly in the anterior part of the circle of Willis, it was decided to clip the right anterior cerebral artery, in order to reduce the risk of recurrent haemorrhage. At operation through a right frontotemporal craniotomy, the right frontal lobe was elevated and the right anterior cerebral artery was clipped as it crossed the right optic nerve. After this operation the patient had a very slight weakness of the left side of the face and left upper limb, lasting a few days. She was totally incontinent of urine. This incontinence eventually improved, so that by 6 months after the operation, she was incontinent only during sleep and had frequency and urgency of micturition when awake; the incontinence during sleep occurred 2 or 3 times every night; when awake she passed urine about once an hour. The patient was distressed by these symptoms. She said she had very little warning of when she wanted to pass urine, and then the urine just passed. Investigation of these symptoms at another hospital to which she had been sent by her general practitioner failed to reveal any gynaecological or urological cause for them. A cystometrogram carried out 2 years after the operation on the aneurysm is shown in Fig. 3. When the catheter was passed, there were 120 ml. of residual urine. The pressure rose rapidly to 10 cm., and remained rather high throughout, though not beyond the limits of the normal. The most abnormal feature was the frequent occurrence of detrusor contractions, which started when the bladder contained less than 100 ml. of fluid; she could not stop these contractions. A normal feeling of fullness developed after 350 ml. had been dripped in which increased with the fluid volume.

Case 3. Mr. L.B. This 38-year-old man, while watching television, suddenly developed severe headache, followed by vomiting. The patient did not lose consciousness, but he was amnesic for the events of the following half hour. On admission to the Regional Centre of Neurosurgery, 36 hours after the onset of his illness, he was conscious, normally orientated, and had severe meningism. There was a very slight weakness of the right side of the face and the right upper limb; the plantar