ON A REMARKABLE CASE
OF
LESION OF THE MEDULLA
OBLONGATA;

WITH REMARKS, &c.

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THE important bearings of the following case on the views of physiologists with reference to the functions of some portions of the nervous centres, appear to me to render it desirable that the case should be brought under the notice of the Fellows of this Society. For the opportunity afforded me of seeing the patient, herein referred to, during life, and of carefully examining the injured parts after death, I am indebted to my colleague, Mr. Hakes, one of the surgeons of the Liverpool Northern Hospital, under whose care the man was admitted, and at whose request I saw him. Mr. Hakes also placed at my disposal some notes he took of the patient; and the structures which were the seat of the lesion are now in the museum of the Royal Infirmary School of Medicine.

John McB—, æt. 23, a seaman, was admitted into the Liverpool Northern Hospital, about noon of the 19th February, 1863. He was in perfect health on the previous day, when, whilst at work on board his ship, he was struck on the left side of the face by a capstan bar. The exact time at which the accident occurred is not known; the blow lifted him from off the deck, and he fell on his back. He was stunned for a short time, but soon recovered. No history was obtained of what took place between the time of the injury and 12 o'clock on the following day, when he applied for admission into the hospital, and walked into the institution leaning on the arm of a man on either side of him. He was immediately put to bed, and shortly after, on paying my visit to the hospital, I was requested by Mr. Hakes to see him.

The following are the symptoms which were noted by Mr. Hakes, the two house surgeons, and myself.

The patient was well made, and tolerably muscular; he was lying in bed on his back; he was perfectly conscious, understood everything that was said to him, and answered questions rationally and distinctly; the articulation was not, however, quite perfect. He complained of slight dizziness of the head, and of a slight numbness of the right side of the face and of the right arm and leg. He was unable to swallow, and had constant hiccough; the face was dusky, the breathing quiet, and the pulse 100 and regular. The tongue was protruded in a straight line, but the uvula was found on examination of the mouth to be drawn towards the left side of the fauces.

There was partial loss of power of the right side of the face, and of the right arm and leg. Both these limbs, however, could be readily raised, but not so easily as those of the opposite side. He could open and shut both eyes at will; the pupils were rather more than normally dilated, they acted irregularly, and the eyeballs were constantly oscillating. No affection either of vision or of hearing was complained of.

A careful examination of the surface of the body revealed the following facts, which were observed by all present. The right side of the face, the right arm, and the right leg were sensibly of higher temperature than the same parts on the opposite side. The patient said he could distinctly feel when touched on either foot, leg, or arm, or on either side of the face. It was thought that sensation was slightly less perfect on the right side than on the left, but on both sides it was good.

The patient being unable to swallow, and having been without food for many hours, some beef tea was introduced into the stomach, but was almost immediately rejected. He continued without material change till about 5 o'clock p.m., when, having asked for some water, he sat up and attempted to swallow it; the attempt was unsuccessful. Whilst sitting up he fell back in the bed, and died somewhat suddenly, having survived the accident about twenty-four hours.

An examination of the body was made twenty hours after death.

There was no fracture of any part of the cranial bones nor of any of the vertebræ. The substance of the cerebrum was perfectly healthy, and no extravasation was anywhere found; its cavities were free from fluid effusion, and the nerves arising from the base of the brain, except as will be hereafter mentioned, were uninjured. There was a considerable quantity of slightly coloured fluid at the base of the skull, and in the spinal canal. The venous sinuses of the head were much gorged with blood, which flowed very freely when these vessels were divided.

The base of the brain, the cerebellum, with the medulla oblongata, and a portion of the spinal cord, were carefully removed. The right hemisphere of the cerebellum was found slightly lacerated on its under surface, close to the side of the right restiform body. This laceration was very superficial. The medulla oblongata, at its posterior aspect and right side, was the seat of an extravasation of blood lying beneath the pia mater and in the substance of the medulla. The extravasation extended, but not continuously, for about

an inch and a quarter, downwards; it was connected with two lacerations of the nervous structure. The parts were placed in spirit and left for future examination.

When the brain substance was somewhat hardened, and a careful examination was made, the upper of the two lacerations referred to was found to involve the right restiform body, which structure was divided transversely about its middle. The laceration extended to within a very short distance of the median furrow of the fourth ventricle behind. To the outer side, and in front, the laceration extended as far as the line of origin of the eighth pair of cerebral nerves. Blood was effused between the lacerated parts, and the adjacent nervous substance was infiltrated with blood. The median furrow of the fourth ventricle was pushed a little towards the left side. As far as it was possible to judge, this laceration involved the whole, or very nearly the whole, of the fibres of the restiform body and a portion of the gray matter spread out on the floor of the fourth ventricle.

None of the roots of the eighth pair of nerves were torn, but the laceration extended close to the superficial origin of the glosso-pharyngeal and par vagum, and no doubt involved their deep fibres.

The second or lower laceration was situated just below, and to the right of, the nib of the calamus scriptorius, and was a little more than half an inch below the upper laceration. It had divided that part of the medulla which is known as the posterior pyramid and the tract outside it, which is the continuation of the posterior column of the spinal cord. The laceration extended about one sixth of an inch into the nervous substance. It stopped behind at the median fissure, and externally it did not extend beyond the line of attachment of the posterior roots of the spinal nerves. Blood was effused at the seat of this laceration as at the superior one, but in much less quantity; the lesion was altogether of smaller extent than the other.

These two principal lacerations were connected by a vertical one, which ran down from the upper lesion along the inner side of the restiform body until it terminated below

by joining the lower laceration ; this was also the seat of effused blood.

The heart and lungs were examined. The former was healthy, the latter were found loaded with very dark blood ; no difference was observable in this respect between the two lungs.

Remarks.—The interest of the preceding case lies in the fact that the parts of the nervous centres which have been supposed by many physiologists to be the channels through which sensitive impressions are conveyed to the sensorium, were divided on one side, without loss of sensation following. The division of the restiform body was so complete, that it can scarcely be said that any portion of it remained untorn ; so that, even admitting that the inferior laceration did not completely divide the continuation of the posterior column of the cord, although it is probable that but few fibres remained intact, the division of the tract higher up was almost, if not entirely, complete.

The case presents us with a repetition on a healthy man of those experiments, so frequently performed by the physiologist on the lower animals, where the posterior columns of the spinal cord, or the restiform bodies, are divided for the purpose of ascertaining the conditions which result. Had the parts been divided with the knife, they could scarcely have been made to involve the injured portions, without encroaching on other parts, more completely than in this accidental lesion.

The results of the case are directly opposed to the theory which has been supported by many eminent physiologists, that the posterior columns of the cord and their continuations, the restiform bodies, are the tracts by which sensitive impressions are conveyed from the posterior roots of the spinal nerves to the sensorium ; and they tend to confirm in a remarkable manner the views of several recent physiologists that no such function is performed by these parts. Unfortunately, as far as I could see, the case does not give us any clue as to what the function of these nervous tracts

is ; the results are of a negative character, not the less important, however, as affording a support for theoretical views founded on experimental inquiry on the lower animals and pathological observations on man ; and although the case is not of such a nature as to enable us to establish a positive doctrine of the function of the injured parts, it may help to clear up any doubt which may still exist as to their supposed function, and thus assist in the attainment of the truth.

With regard to the minor symptoms of the case it is remarkable how they, for the most part, agree with the lesion of nerves which was found after death. So severe a laceration of the restiform body could scarcely have happened without involving the origin of the facial, the glosso-pharyngeal, and pneumogastric nerves. The injury to these nerves satisfactorily accounts for the paralysed condition of the right side of the face and soft palate, for the inability to swallow, and the constant hiccough, which latter is probably referable to the lesion of the pneumogastric.

The immediate cause of death I have not been able to satisfy myself about, but from the testimony of those who were present—the nurse of the ward and others—a somewhat sudden arrest of the function of breathing seems to have occurred.

Hyperæsthesia has been described as following experimental divisions of the restiform bodies and the posterior columns of the spinal cord : no such condition was observed in this case.

DESCRIPTION OF PLATE V.

Posterior view of medulla oblongata with the cerebellum divided.

- a.* Posterior median fissure of medulla oblongata.
- b.* Right restiform body.
- c, c.* Incisions carried through the back part of the medulla on a level with the lacerated parts.
- d.* Right posterior column of cord.