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A FATAL CASE OF CONCUSSION OF THE SPINAL CORD.

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E. A., æt. 25, was admitted into St. Thomas's Hospital, under the care of Mr. Francis Mason, on January 27th, 1883, and died on March 12th, 1883. I have to thank my colleague for permission to publish the following account:

The patient was one of six persons upon whom a house fell; she was found with only her head protruding from a large heap of bricks and rubbish, and was brought on a stretcher to the hospital.

On admission, she was said to have been struck upon the back-bone, and she complained of extreme pain across the sacrum and of numbness over the left buttock. There was no anæsthesia and no paraplegia, nor was there any external evidence of fracture or of other gross injury. There was, however, retention of urine.

An abnormal condition of the right leg and arm was present, but this had existed from birth. It consisted of partial paralysis and atrophy of both limbs without loss of sensation, but with some contraction of the flexor muscles of the arm. The patellar and plantar reflexes were exaggerated on this side, but there was no ankle clonus.

During the first week she was in the hospital, there was complete retention of urine and the bowels only acted once, and that after an enema. After this, incontinence of urine and fæces set in, and persisted till death.

At the same time that the evacuations began to pass involuntarily, a bedsore suddenly appeared on each buttock. They occurred first as blebs situated on the lower edges of the buttocks, one on each side of the perinæum. They were perfectly symmetrical, and, as the patient lay on her back, they were quite free from contact with the bedding. They soon burst, and then became ulcers. About a week later a swelling made its appearance on the sacrum, which was angry-looking and inflamed, and rapidly became an open bedsore.

The temperature up to the time of the incontinence of urine was only slightly raised, generally ranging at its highest

between 100° and 101° F.; but after this, up to the time of the patient's death, it was more elevated and of the hectic type, varying from normal to about 103°. This was accompanied by an ammoniacal condition of the urine and other signs of cystitis.

She died gradually of exhaustion on March 12th, and during the last weeks of life the acute bedsores began to heal.

Post-mortem examination.—Body emaciated, legs wasted, the right more so than the left; right arm also wasted and flexed at the elbow. The diminution in size of the right arm and leg appeared to affect the limbs *en masse*, and not to be due to wasting of any particular muscle. There were three bedsores, one of which was over the sacrum. The other two were remarkably and symmetrically situated. As the body lay on the table and the observer stood at the feet, two circular sores, about 1½ inch in diameter, could be seen on the buttocks, so situated one on each side of the perinæum, that they nowhere came in contact with the table. They were evidently healing, as a margin of pinkish-white, transparent, new skin, about ¼ inch broad, surrounded them.

There was no evidence of gross injury anywhere, either in the skull, vertebral column, muscles, ligaments, or long bones.

There was acute cystitis with thickening and contraction of the walls of the bladder, and likewise acute inflammation and dilatation of both ureters and thickening of their walls. The inflammatory process extended into the pelvis and calyces of the kidneys, and then in streaks through the medullary portion of the organs to reach the cortex, where the streaks ran into irregular groups of suppurating points. Both ureters contained pus, the right in the upper half of its course towards the kidney containing more than the left. This inequality seemed to be due to the presence of a slight stricture in the right ureter, halfway between the bladder and the kidney. The heart, lungs, and other viscera were normal.

On opening the spinal canal no fracture of bone, thickening of membranes, or hæmorrhage was observed; all appeared normal. In its lower half the cord was normally firm, except two or three inches in the upper lumbar region, where it was soft and slightly wrinkled transversely. The upper half, though not evidently pathologically softened, was not so firm as the lower lumbar region. In several places the right anterior cornu looked smaller than the left.

The brain was unsymmetrical, the whole of the left hemisphere being smaller than the right, and the temporo-sphenoidal lobe and angular gyrus more seriously malformed. This was evidently a congenital abnormality, and it has been fully described by me in a paper read before the Medico-Chirurgical Society on the 8th of May, 1883.

On microscopic examination of the cord sclerosis of the right lateral column was found, which was evidently in connection with the abnormality of the left cerebral hemisphere. The changes found in the softened portion of the lumbar region were distension of the perivascular spaces, and a soft, porous condition of the grey matter adjacent to the grey commissure on each side, but there were no distinct traces of inflammation.

Microscopic examination of the lumbar enlargement revealed nothing abnormal, except a vessel here and there with a few leucocytes around it.

Remarks.—With regard to the spinal cord the autopsy must be considered to have yielded negative results. For the softening in the lumbar region cannot be taken as evidence of disease, this being the position in which post-mortem softening is most frequently found; and of the latter process this cord probably afforded a specimen.

Nor did the microscope furnish any positive proofs, though it did some suggestions, that recent disease had been at work, and that the cord had all but completely recovered by the time the renal affection proved fatal.

If by concussion of the spinal cord be meant disease of the spinal cord set up directly by the shake of an accident, and not indirectly by the pressure of a fractured or dislocated bone, or of a hæmorrhage external to it, or by any such primary result of the accident, then it seems to us that the present case affords an example of concussion of the spinal cord. As no injury to bones, muscles, ligaments, &c., was detected on careful examination, we must assume that if the symptoms proceeded from disease of the spinal cord at all, the latter resulted directly from the force of the accident, whatever may have been the precise mechanism by which the result was produced.

The question then is, Was this a case of disease of the spinal cord?

It is true there was an absence of any loss of muscular power or of sensation, which are the usual phenomena produced by affections of this part of the central nervous system; but, on the other hand, other symptoms were present which are very common concomitants of paralysis and anæsthesia in acute disease of the cord, viz. (1) Retention and then incontinence of the evacuations, and (2) so-called acute bedsores.

These conditions must have been due either to direct local injury of the parts affected or to nerve lesions, either peripheral or central. We may set aside the idea of local injury of the bladder, bowel, and perinæum, as there never was the slightest evidence of it. The question only remains whether the symptoms were due to peripheral or to central nerve lesion. It is difficult to suppose that the nerves supplying the bladder and

rectum should have been directly injured, when at the post-mortem examination not the slightest damage to other parts could be discovered; and it would be still more incredible that a precisely symmetrical lesion should have affected the perineal nerves. The only reasonable explanation of the exact symmetry of the acute bedsores in the perineum, which were situated on parts not exposed to pressure, is that the cord was diseased at the spot in the lumbar region where the perineal nerves approach or meet each other. And this would equally explain the affection of the bladder and rectum.

But it may be objected that no disease of the spinal cord was actually found. To this we answer, that physiological reasoning in this case is of more value than arguments based on our inability to find pathological changes, and that for two reasons:

1. Because it is impossible to examine more than a small portion of the cord microscopically. And although such scant examination shows us the anatomical changes of disease when extensive, yet our not finding alterations in the few sections we examine is no proof of the absence of a small focus of disease. In the present instance the focus must have been very limited in extent.

2. It is legitimate to suppose, that if we had had an opportunity of examining the cord a week or so after the injury we might have found disease; and yet that six weeks after the accident all morbid changes, except the few doubtful ones recorded, might have cleared up. For the bedsores had long been healing, and death was the result not of progressive cord disease, but of an unfortunate cystitis and suppurative nephritis which early accompanied the paralysis of bladder.

It seems then that the only reasonable conclusion is, that owing to the concussion of the spinal cord produced by the force of the accident a small focus of disease resulted, which would probably have ended in the recovery of the patient, had not secondary disease of bladder and kidneys unfortunately proved fatal.

Satisfactorily proved cases of concussion of the spinal cord are undoubtedly rare; but we must remember, that in order to prove them we require a post-mortem examination. This case at least suggests what other considerations would render probable, that in severe accidents small focal lesions may result from concussion, and although they may cause very obscure and annoying symptoms, yet as they are small in extent and have not damaged vital parts they terminate in recovery, and leave us to argue as to the cause of the clinical phenomena we observe, without giving us the opportunity of proving whether our conclusions are correct.