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WITH AUTOPSY.

BY

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A CASE OF BROKEN NECK, WITH AUTOPSY.¹

BY EDWARD O. OTIS, M.D.

H. L. W., JR., a student, seventeen years old, was attempting to do the "cut-down" in the gymnasium of the institution where he was at school, when he fell upon the underlying mattress. This accident happened about five o'clock in the afternoon of January 20th. The "cut-down," as it is called in gymnasium parlance, is a simple feat. The performer stands beneath the parallel flying rings, holding them in his hands. He swings his feet up so as to throw them inside his hands, and letting go without breaking the continuity of the swing, lands upon his feet. It is a pretty and not a difficult trick.

Young W. when about the middle of this manœuvre, fell a distance of about five feet, upon a thick mattress lying beneath. He fell at the point of time when his head was down and the superincumbent body was moving forward with the momentum of the swing. The resultant of the two motions was that he struck upon his head—the occipital part—and upon his knees and elbows. The weight of the body, then, bent over the cervical spine on the one hand, while the head resting on the mat, held it fixed, on the other. The boy weighed about a hundred and twenty-five or

¹ Read before the Surgical Section of the Suffolk District Medical Society, May 4, 1892.



thirty pounds, and had a long, slender neck. The weight of the body, not the force of the fall, did the mischief.

As one can readily see, no more perfect way of breaking one's neck could be devised; and yet in a considerable gymnasium experience I have never seen or heard of this or any accident happening in the performance of this common trick, although it possesses this awful possibility. There is no evidence to show that the fall was accompanied with any great amount of pain. Paralysis was immediate, the patient finding it impossible to extricate himself from the peculiar position in which he had fallen. He was seen by his attending physician, Dr. Nute, of Exeter, N. H., who had him very carefully transported to his room, near by, on a stretcher.

I saw him, together with Dr. G. W. Gay, of this city, the next forenoon, seventeen hours after the accident. There was complete paralysis below a line drawn two or three inches above the nipples. He could flex the forearm upon the arm, but could not extend it, or make any other movement of arm or hand. Respiration was diaphragmatic. There was paralysis of bladder and intestines. He could rotate the head, but any antero-posterior movement gave him pain. There was a tender spot, painful on pressure, between the fourth and sixth vertebræ. There was no sensation in the paralyzed portion of the body. He could swallow perfectly well, but could not clear his throat. An attempt was made by extension, coun-

ter-extension and manipulation to reduce whatever displacement might exist from dislocation or fracture. This gave him much pain and was apparently without result. Operative interference was not advised.

I saw him again the next forenoon, January 22d, and thenceforward constantly until the end, and made another attempt with his attending physician to reduce whatever displacement there might be. Extension and counter-extension with rotation was tried, and twice we heard something snap, which was also noticed by the patient, but no results followed. We then applied permanent extension from the occiput and chin, with a weight of from seven to twelve pounds, and counter-extension by elevating the head of the bed. This seemed to give him relief and when it was discontinued from time to time he often asked to have it re-applied. He was given simple liquid nourishment, catheterized regularly, and the tympanites was relieved by a rectal tube kept *in situ*. An ice-bag was placed at the back of his neck. The temperature was about a degree above normal, the pulse 62, and the respiration 24. His mind was remarkably clear and he was perfectly self-possessed, although he realized the gravity of his condition. His fortitude for one so young was remarkable; he expressed himself as having no fear, and showed the greatest care and consideration for all about him. Not the slightest thing escaped his notice, and he frequently suggested little devices for his own comfort.

On Saturday, January 23d, the third day after the

accident, breathing became difficult from the accumulation of mucus. This was removed from the throat and larynx by a pair of long placental forceps with cotton. Then nitro-glycerine, one-fiftieth of a grain, was given, which had a most marvellous effect in clearing the lungs with great rapidity. The administration of this drug was continued every three or four hours up to the time of his death. Brandy and aromatic spirits of ammonia were also given from time to time. On Saturday afternoon dissolution seemed imminent, but the heroic determination of the patient to live until his mother arrived from the West, together with the happy effect of the nitro-glycerine, seemed to be the factors in averting imminent death. On Sunday, January 24th, the fourth day after the accident, the temperature arose to 102° , the pulse to 96, and the respiration to 40. By trying to breathe as gently and quietly as possible he seemed to keep the collection of mucus at a minimum. He would sleep an hour or two at a time. Now and then for a moment he would be delirious. On Monday, the fifth day, the temperature went up to 104° in the afternoon, the respiration varied from 40 to 44, and the pulse from 98 to 112, and at times would become very weak. Death took place early Tuesday morning, the sixth day after the accident.

An examination was made of the spine in the cervical region, nine or ten hours after death. Drs. W. T. Bull of New York, Symington of Sante Fé, New Mexico, Perry and Nute of Exeter, N. H., being

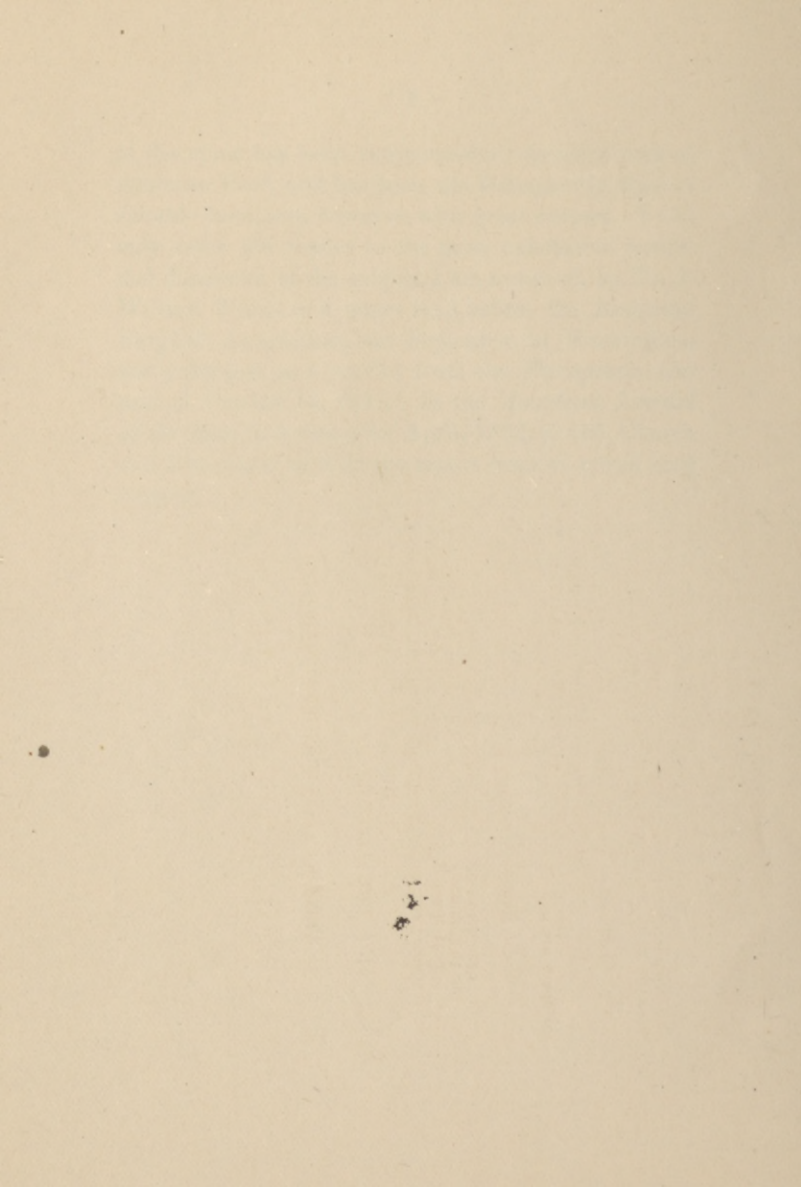
present. The space between the atlas and atloid seemed to be unusually wide, but the ligaments were not torn. Neither did there appear to be any rupture of the various ligaments anywhere in the part of the spinal column examined. A fracture of the lamina of the fifth or sixth cervical vertebræ was found, but no displacement. Neither was there a dislocation anywhere. On opening the spinal canal over the seat of fracture the dura was moderately injected and the spinal cord was found to be soft and diffluent. The bodies of the vertebræ were in place. If a dislocation or displacement occurred at the time of the accident it is probable that it immediately righted itself. The cord, however, was probably crushed and irretrievably damaged at the moment of the accident, remembering that the paralysis was immediate. In the light of the autopsy no operation could have accomplished anything, thus verifying Moullin's statement² that "in cases of fracture by indirect violence, the operation of trephining offers little or no hope. It is probable that in the majority of cases the cord is only subjected to momentary compression, but yet it is so reduced to a pulp that recovery of function very rarely follows."

Such a case as this, however, is a most trying and unpleasant one for the surgeon, for, as Dr. Gay remarked, his inclination is to attempt some operative interference, but his judgment opposes it. The length of time the patient survived such an injury is remarkable and unusual I think. Operation in case of injury

² Treatise on Surgery, 1891, p. 661.

of the spine has been recommended since the time of Ambrose Paré, and has been not infrequently done in suitable cases, not, however, with great success. I will only refer the reader to the most exhaustive review and discussion of the subject I am aware of, by Dr. J. William White, in a paper read before the American Surgical Association, last September, in Washington, and published as a reprint from the *Therapeutic Gazette* of October 15, 1891. In the *American Journal of the Medical Sciences* for April, 1892, p. 395, Church and Eisendrath of Chicago report cases of spinal cord surgery.





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