my operation was contra-indicated, for nephrectomy is not generally considered to be the operation for renal calculus. In my case the result has justified my selection. It was made on account of the uncertain diagnosis, the size of the tumor and the necessity for room for work. The kidney was so disorganized as to be functionally worthless, and if nephrotomy had been done the evidence is in favor of a renal fistula as a result. My patient is not only relieved but is well, and recovered rapidly.

As regards the route, I think there was here no choice, for if in such a case nephrectomy is the selected operation it must be abdominal. I do not see how the operation would have been possible by the ordinary lumbar method on account of the size of the tumor and its adhesions.

By the König lumbo-abdominal operation or similar modifications, such an extensive division of the muscles would be necessary that the operation would become practically a transperitoneal one before its conclusion. Again, the abdominal route has the following advantages:

A better opportunity for diagnosis.

A better appreciation of the exact conditions under which the operation must be done.

An opportunity to examine the remaining kidney.

More space for operation.

An easier access to the pedicle.

(3) The dangers of the operation seem to be: (1) shock; (2) hemorrhage; (3) uræmia; (4) peritonitis; (5) septicæmia; (6) Renal fistula.

(4) I have wondered at the comparatively slight constitutional disturbance and uneventful rapid recovery from so extensive an operation. The condition resembles that seen after continued exertion or great fatigue. Also at the rapidity with which the urine became normal, and the readiness with which the remaining kidney performed its increased task.

(5) The case demonstrates that it is possible to obtain a recovery by nephrectomy without drainage, and it is preferable to drainage, if followed by its frequent unsatisfactory sequel of fistula and its attendant discomforts. This, even when the peritoneal cavity has been tainted with fluid from a kidney extensively disorganized by a suppurative pyelo-nephritis.

NOTE.—Patient last seen on July 1, 1892. Was in perfect health as far as could be ascertained.

Clinical Department.

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.

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

Young W. when about the middle of this manoeuvre, 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 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 vertebrae. 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, counter-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 Santa Fé, New Mexico, Perry and Nute of Exeter, N. H., being present. The space between the atlas and axis 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 vertebrae 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 diffuent. The bodies of the vertebrae 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 of the spine has been recommended since the time of Ambrose Pare, 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.

² *Treatise on Surgery*, 1891, p. 661.

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.

CANCEROUS KIDNEY REMOVED BY LAPAROTOMY; RECOVERY.¹

BY S. J. MIXTER, M.D.,

Surgeon, Carney Hospital; Surgeon to Out-Patients, Massachusetts General Hosp.; Demonstrator of Anatomy, Harvard Med. School.

CAPTAIN J. B., age sixty, of late lighthouse-keeper and formerly sailing-master, was sent to me in July, 1891, by Dr. MacKeen, of Cow Bay, C. B., on account of an abdominal tumor, probably renal.

Several months before, he had stepped through a hole in the floor while going about in the dark, and struck heavily against a beam. He was unconscious for a few minutes and on coming to found that he was severely bruised in the left side just below the ribs. He was confined to his bed for a few days, and soon resumed his usual work.

He first consulted Dr. MacKeen on June 20, 1891, on account of hypogastric pain and hematuria. The bladder was found to be distended with urine and blood-clot. Considerable quantities of fresh blood and clots were passed for nine days when the urine became clear and has remained so ever since.

When I examined him in July, I found him to be a man of about six feet in height, weighing about two hundred pounds, and the picture of health and strength. In the left of the abdomen could be felt a hard, quite movable mass, about the size of a cocoanut, filling that side to a point between the linea alba and linea semilunaris. There was no tenderness on pressure and no suggestion of fluid.

The position of the descending colon was not made out, though it would probably have been easily located had it been distended by air injection. Nothing abnormal was to be found in the other organs or in the urine.

Dr. Fitz examined the patient with me, and agreed with me that the mass was probably an enlarged kidney, which, even if cancerous, was so movable as to offer a good chance for its removal.

The patient entered the Carney Hospital, and on July 22d I operated. On opening the abdomen through the left semilunaris I found the descending colon outside and somewhat behind the tumor. A small cut was made through the peritoneum which covered it, and by stretching and tearing an opening of sufficient size was made for the removal of the mass, without damage to the large branches of the inferior mesenteric vessels. Gauze pads packed into the abdominal cavity kept the intestines out of the field of operation and also prevented the blood from getting into the peritoneal cavity.

The tumor was covered by a network of enormous veins that ruptured at the least violence, and it was necessary to work very rapidly in order to secure the renal vessels, the hemorrhage being tremendous. As soon as the vessels could be felt and partially isolated a large clamp was placed on them and the ureter, the

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