

THREE CASES OF WIRING OF THE PATELLA FOR
OLD FRACTURE WITH DIVISION OF THE QUAD-
RICEPS MUSCLE, AND CHISELLING LOOSE THE
TUBERCLE OF THE TIBIA IN TWO OF THE
CASES.¹

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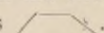
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CASE I.—H. K., aged thirty years; weight, 240 pounds; six feet two inches high. First consulted me at the Jefferson College Hospital, February 14, 1894, at the instance of Dr. T. H. White, of Connellsville, Pa. Dr. White gave me the following history: that the patient was the superintendent of a lumber establishment, and on October 9, 1892, fractured his right patella by a fall. Dr. White treated him by means of adhesive strips, and a posterior splint with a very satisfactory result, there being merely a narrow seam between the two fragments. On February 14, 1893, he slipped on a wet board and fell with his whole weight on the injured knee in a flexed position, rupturing the ligamentous union which had been secured. He returned to Dr. White, who treated him with a full length leather splint, in which tongues were cut above and below the knee to receive the adhesive strips and bandages used in bringing the fragments together. This was worn for several weeks after leaving the hospital. The space between the fragments was about one-half inch. May 24, 1893, he again fell, stretching the union still farther. He was treated as before, and when discharged the separation of the fragments had increased to one and a half inches. On December 27, 1893, he fell for the fourth time and still farther separated the fragments, which now amount to three and a half inches in extension and five inches in flexion. Even with this wide separation he has

¹ Read before the Surgical Section of the College of Physicians of Philadelphia.

fair use of the leg when he is walking on an even surface, but over rough ground or over logs, as he is compelled to walk over by his occupation, the leg is unstable.

Operation, February 19, 1894. A vertical incision was made in the axis of the limb, which was finally extended to about twelve inches, for reasons which will appear later. The knee-joint was opened, and cultures made from the fluid in the interior, the result being negative. It was found filled with synovial fluid, mixed with the remains of blood-clots. The anterior surface of the femur was very red, presumably, however, rather from staining of the blood than from inflammation. The two fragments of the patella were separated three and a half inches, the upper fragment (about three-fourths of the whole bone) being an inch in thickness antero-posteriorly. The lower fragment was split off from the upper obliquely, from above downward and backward, making its upper edge, or that which presented towards the other fragment, but little over a quarter of an inch in thickness.

After sawing off the fractured surfaces, by which about half of the lower fragment was removed, the two fragments were drilled and an attempt made to join them by means of silver wire (diameter No. 3, French catheter scale), but the fragments could only be brought to a distance of two and a half inches. Therefore, having prolonged the incision, as before stated, upward, I divided the tendon of the rectus about two and a half inches above the patella completely down to the bone, together with two incisions from the end of this transverse one, respectively outward and inward thus . When this division was effected, I was able to get the two fragments within about an inch and a half of each other, but by no possibility would traction effect their approximation any further. Accordingly I chiselled away the tubercle of the tibia, together with a considerable portion of the thickness of the bone in a V-shaped fragment. This loosened the lower piece so that I could just get the fragments to touch when the leg was in extension. Each fragment of the patella was held chiefly by lateral fibrous attachments. The lower end of the piece chiselled from the tibia tilted so much upward when traction was made that I wired transversely through the edges of the tibia, passing the wire in front of the lower end of the fragment, in which I sawed a slight groove in order to hold the wire. The ends of both wires were cut off and gently hammered into the bone. The soft parts on the outer border of the two fragments of the patella

were drawn together, where they gaped considerably, by means of a double silkworm-gut suture, which was buried. All the soft parts that were incised bled profusely, a number of small arteries close to the bone spurting freely. They were controlled, however, by hot water and pressure and hæmostatic forceps without any ligatures. The incision was now sutured and the leg placed on a Macewen splint.

On February 20, the day after the operation, an incision was made at the inner and lower part of the wound and a drainage-tube inserted. On the 22d the drainage-tube was removed, the wound being in excellent condition.

He made an uninterrupted recovery, and was discharged in eight weeks, walking with a cane. After five weeks, active and passive movements were begun.

April, 1895. After fifteen months the result is excellent, flexion to ninety degrees being easily attained. The fragments are slightly movable on each other. The wire has never given any trouble.

CASE II.—Mrs. M. E., Glencarbon, Pa., aged forty-three years, was admitted to the Jefferson College Hospital March 3, 1894. In August, 1893, she fell while descending a flight of steps and hurt her knee. It was not seen by a physician until the following day, when the swelling was so great that he could not tell what was the trouble; when the swelling finally subsided a fracture of the patella was discovered, but the fragments were so far separated that union was impossible. She is in good health, bowels constipated, urine acid, cloudy, sp. gr. 1020, neither albumen nor sugar.

Operation, March 7, 1894. The knee was opened by a vertical incision, the intervening fibrous tissue removed, and the bones brought together by force, and wired with No. 3 silver wire (French catheter scale) and the wire hammered into the bone; dressed on a Macewen splint. The external sutures were removed on the eighth day. A small abscess formed on the inner aspect of the knee, and another abscess in front of the knee, during the treatment. The highest temperature was 100° F.

March 4, 1894, the splint was removed and passive motion was begun. She could walk without aid. The leg could be bent to a right angle and was still improving, when she was discharged March 14, 1894.

CASE III.—S. J. DeH., Meyerstown, Pa., aged forty-two years, was sent to the Jefferson Hospital by Dr. Krum, of Lebanon, January 8, 1895.

Six months previously, by an accident on the railway, he struck his right knee and fractured the patella transversely. The fracture was treated with adhesive strips and a posterior splint, and he recovered with an interval of one and a half inches between the fragments. Last September, by a misstep, the fragments were dragged farther apart, so that they are now separated two and a half inches in extension and five inches when the leg is flexed. The function of the joint is very much impaired.

Operation, January 9, 1895. I exposed the patella by a vertical incision in the axis of the leg, dissected away the tissue between the two fragments, and sawed off a portion of each. With all the traction I could make upon the fragments they were still separated two and a half inches. Accordingly I prolonged the incision upward and downward, and repeated the operation described in Case I. Cultures made at the time gave a negative result. I was now able to bring the fragments into very satisfactory apposition. The twisted end of the wire I hammered into the bone. The ligamentum patellæ was firmly attached to the tibia by lateral fibrous tissue. The point of the ∇ was so tilted forward that I removed it with bone pliers. The wound was then closed by interrupted sutures.

His temperature after the operation rose to nearly 100° and 102° F. for about a week. This was due to the accumulation of blood at the site of the cross-section of the muscles. Some stitches were removed and the wound irrigated two days after the operation, when his temperature gradually fell to the normal. After five weeks of extension and elevation of the leg by a posterior splint passive motion was begun, and when he left the hospital on March 6 (eight weeks after the operation) he was able to bend the leg over one-third of the full flexion. The fragments were very slightly movable upon each other.

REMARKS.

My experience in these cases is very favorable to the combined triple operation of wiring the fragments of the patella, section of the quadriceps muscle, and chiselling loose the tibial attachment of the ligamentum patellæ when the two fragments cannot otherwise be brought into apposition. No reaction followed the larger violence, and the only unfavorable point was in connection with the section of the quadriceps at the upper end of

the incision. This leads me to suggest the following modification of the technique :

First, I shall hereafter make an anterior *flap* of skin beginning on a level with the upper border of the patella and extending downward an inch below the tubercle of the tibia. When this is dissected up, the operative procedures in wiring the patella and, if need be, chiselling loose the tubercle could be undertaken as usual, and then the line of union of the patella and the wire and the point at which the tubercle is chiselled loose will not be exposed to possible infection or other accident by lying immediately behind the line of incision, but will be entirely covered by a solid flap. If it is necessary to divide the tendon of the quadriceps or of the rectus alone above the patella, this can be done by an entirely independent incision, which could be drained, if need be, and the possibility of contamination of the knee-joint by accumulation of blood-clot through the long incision be avoided.