THE BOSTON MEDICAL AND SURGICAL JOURNAL.

VOL. LII.

THURSDAY, MAY 17, 1855.

No. 15.

SECTION OF THE OS FEMORIS FOR ARTIFICIAL HIP-JOINT.

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[Communicated for the Boston Medical and Surgical Journal.]

BEFORE relating the case which is the principal object of this paper, I will narrate one which took place previously, and was a sort of preparation for it.

About the year 1820, the mate of a vessel, whose leg had been broken at sea, entered the Massachusetts General Hospital with a remarkable deformity of the injured limb. The tibia and fibula had been broken, and not having been restored to their natural situation the foot was everted so much as to form the segment of a circle. The internal angle was in consequence brought to the ground, and had become ulcerated by pressure on the ground in walking. The union was perfectly firm, and the bones could not be in any way altered by mere manual force. Seeing he would be badly crippled for life unless some operation was resorted to, I exposed the tibia on the inside by a proper incision, and with a small hand-saw cut out a piece of this bone of a wedge-like form. The fibula still retaining the limb in its distorted position, I broke this bone by manual force, brought the sawn ends of the tibia into contact, and applied splints and bandages. The patient was well in a month. The two limbs were of the same length, the power of locomotion on the feet perfect, and the limping very slight.

In 1827 a remarkable operation was executed by the distinguished surgeon, Dr. Barton, of Philadelphia, for the formation of an artificial joint in a case of ankylosed hip. The successful issue of this and other cases led me to perform the operation which is to be described here.

John Scannell, 32 years old, married, and who had been domestic in the families of Hon. Robert C. Winthrop and of Mrs. Sayles, while living with the latter, in Tremont st., was called on in February, 1848, to shovel a large quantity of snow from the house yard. He was at that time in perfect health. On the following day he was attacked with intense pains in the pelvis and loins—extending thence into the back. Dr. Holmes being called, made many applications to the seat of pain, and also bled him. These

and other measures failing to give relief, Dr. H. held a consultation with Dr. Bigelow, and afterwards with Dr. James Jackson and Dr. J. Mason Warren.

No relief being obtained, he was admitted to the Massachusetts General Hospital in March, and soon after came under my care. He was then emaciated, in a hectic condition, suffering intense pain, so as to require on the first night of his admission to the Hospital a grain and a half of the sulphate of morphine to produce quiet. This pain was in the back, thence extending into the lower extremities, and was of a neuralgic character, i. e., it passed in the courses of the great nerves from the hips to the toes. The slightest touch being insupportable, it was impossible to examine the back, and with difficulty the limbs.

Notwithstanding the use of air-pillows, air-beds, and water-beds, the sacrum became extensively ulcerated, and also the posterior part of the heels. On May 26th the left lower limb was found to have become inverted; the left foot pressed on the inner edge of the right, and he could not raise, or to any extent move the limb himself. The stomach and digestive organs were disturbed, with frequent vomiting, obstinate constipation, flatulence, local pains in the abdomen, requiring from time to time great quantities of opiates. At length, the pains subsiding, he was taken out of bed, at which time the weight of the body could not be supported on the limbs. As he recovered his strength and disposition to move, it was obvious that the left hip-joint was dislocated and ankylosed. No violence having occurred at any period of his attack, this dislocation was not understood. The other hip and the knee being stiff also, it was thought the stiffness of both might arise from muscular contraction. In consequence of this opinion, on the 28th of August, the patient being put under the influence of ether, the joints of the lower limbs were forcibly flexed and extended. The left hip was found to be immovable, and the left lower extremity so much distorted as materially to interfere with his walking. The right hip-joint had a very limited degree of motion. The right knee could be bent, but with difficulty.

However, he gradually acquired the power of walking, and about five months after his entrance he walked, with the aid of an attendant, into the Hospital grounds for the first time. Then it more clearly appeared, that the left foot pressed on the inside of the right, and interfered with and galled the inner side of the other limb, as before mentioned. On examination, the phenomena of a dislocation were satisfactorily made out, and a consultation being held, it was agreed that measures should be adopted for the reduction of the dislocation. He was accordingly put under the influence of ether, and the pullies applied transversely and longitudinally with great care and attention for half an hour, without accomplishing the reduction of the limb, or any change in its direction or position. At a subsequent period another effort was made at reduction, with no better success.

As the patient had now been in the Hospital over a year, his dislocated limb not improving, and as great inconvenience was experienced from its interfering with the other, I proposed to saw the limb through the trochanter, and attempt to restore it to its natural position. This operation was accordingly performed on March 17th, 1849. An incision six inches long was made in the direction of the limb behind the trochanter, and this was crossed by a transverse incision of three inches. The muscles were then dissected from the bone, and a saw applied about the size and form of an amputating knife. By this the bone was readily divided an inch and a half below the apex of the trochanter major, and the limb being seized was everted and brought to its natural relations. The whole operation required not far from ten minutes, and was painless, the patient being under the influence of ether. About six ounces of blood only were lost. The wound was dressed simply, and after the patient was removed to his bed the limb was a little flexed and supported in its natural position without splints or any apparatus. The consecutive symptoms were not very severe; he had some fever, but the wound healed without difficulty, and he soon recovered his strength.

The tendency to stiffening in the articulations of the lower extremities continued to be remarkable, especially in the right hip-joint and knee. It became necessary to attempt to restore the use of these articulations and prevent a permanent ankylosis. On October 18th, 1849, therefore, the patient being under the influence of chloric ether, and the pelvis firmly held by assistants, the left knee was forcibly bent, when the adhesions gave way. The whole limb was then flexed, extended and rotated at the false joint, performing all the motions peculiar to the hip, with a moderate application of force. Attention was then directed to the right limb, the knee of which was flexed and extended. But all attempts at motion of the right hip-joint were for some time fruitless; at length, the efforts being continued, the contractions gave way with a loud crack. About seventeen minutes were required in the operation, during which he was kept under the influence of ether.

From this time his walking gradually improved, and his health became good, with the exception of pains in the lower part of the back, which have never quitted him.

REMARKS.—Scannell was occasionally employed in my family, so that we knew his history. He is about six feet high, not fat, but a muscular man, very active, industrious, and no drinker of ardent spirits. When I called to see him, March 14th, 1855, in a heavy storm of rain, snow and wind, he was out, but being sent for came home on foot in a very short time, though obliged to use a crutch and a cane. He was glad to see me, and willingly submitted to my examination.

The perfectly erect position he could not assume. He arose from his chair with difficulty, and inclined a little forwards. His right hip-joint was very stiff; he could move it not more than six

or eight degrees ; the right knee and ankle were perfect in their motions. The left limb, that operated on, being moved produced a similar feeling to the patient as motion in the joint to a small extent ; it had about the same degree of motion apparently as the right ; but both appeared very stiff, and their motion readily affected the pelvis, so that it was impossible to determine whether there was distinct movement in either. The left thigh was plump and round, and measured in circumference two inches more than the right, that of the latter being $19\frac{1}{2}$ inches. The left, or limb operated on, was half an inch longer than the other ; the trochanter half an inch lower, and about that space behind its natural situation. The thigh on the forepart, at the groin, appeared slightly excavated and broader than natural, while the left natis to the eye and by actual measurement was half an inch narrower than the right. The foot occupied its natural direction, and was not turned outwards nor inwards.

When I applied my strength to move the lower extremity, he felt the motion in the new articulation, and always feels it when he moves himself ; but on increasing the force the pelvis was moved. The same occurred on the right side. The leg of the extremity operated on appeared very muscular and firm when he stood. He said he had no pain, or uneasiness in any of these movements, nor had he now pain at any time in any part of the lower extremities. It is now a little more than seven years since the attack, and he has never been free from pain in the back. This pain is about the junction of the sacrum with the os coccygis, but there is no sensibility on pressure. I asked what, in his opinion, was the cause of the dislocation ; he said he thought it took place entirely independent of any external violence, from a spasm of rheumatic pain.

A review of this case presents an obscurity in some points of diagnosis. We may conclude, however, that the primary attack was an inflammation of the spinal membranes ; that the nerves of the lower extremities were affected in consequence, and the contraction of the limbs thence followed ; that the dislocation was a consequence of spasmodic action of the muscles ; that the continuance of the pains and stiffness of the limbs was and is rheumatic, and that this rheumatic disposition operates on the artificial joint, as well as others, and circumscribes the power of motion. I made a very careful examination by pressure with the fingers in order to ascertain whether there was any osseous protuberance about the joint, arising either from want of coaptation of the sawn bones or exuberant osseous effusion, but could discover neither. The parts appeared to be in a fair and natural state, so that if he should overcome the rheumatic tendency he may ultimately be able to walk without stiffness.

Boston, May, 1855.