A CASE
OF
EXCISION OF THE KNEE-JOINT FOR
DISEASE

IN A WOMAN FIFTY-THREE YEARS OF AGE,
WITH SUCCESSFUL RESULT.

BY
FREDERICK JAMES GANT, F.R.C.S.,
SURGEON TO THE ROYAL FREE HOSPITAL.

Received February 4th—Read February 11th, 1873.

THE object of this paper is to lay before the Society the particulars of a case wherein excision of the knee-joint was performed for the result of a disease not hitherto but in rare instances submitted to the operation, namely, chronic rheumatic arthritis, and at the most advanced period of life that excision has hitherto, I believe, been practised, or at least recorded, the patient's age being fifty-three years. This case is, therefore, a notable exception to the typical conditions of disease appropriate for excision, which I brought forward in a previous communication, published in vol. liii of the Society's 'Transactions.'

Sarah A—, æt. 53, residing at Dunstable, was admitted into the Royal Free Hospital, July 25th, 1872. The history of her present state, as taken from the report of Dr. M'Kellar, Senior Resident Medical Officer, is briefly as follows :

Twenty-three years ago she had an attack of rheumatism, which, having affected various joints, finally settled in the left knee, giving rise to severe pain and considerable swelling,

which confined her to bed for ten weeks. Recurring arthritic disease lasted up to December, 1871, a protracted period of twenty years. Then she had a fall from some height downstairs, the leg on the affected side being twisted under her. This injury immediately superinduced a worse attack in the knee-joint, and she remained in bed again for nine weeks. Treatment was adopted without affording relief, and at length she came to be under my care at the hospital.

On *admission* the left knee-joint was much enlarged, measuring in circumference two inches more than its fellow ; it had a globular form, but presenting some irregular nodosities, apparently of an osseous character around the articular ends of bone ; the joint had undergone partial dislocation backwards, the head of the tibia projecting behind the condyles of the femur, and false or fibrous ankylosis had taken place, giving some degree of immobility to the articulation, although this depended partly on a generally thickened state of the ligamentous and aponeurotic structures, and on the ossific deposit around the joint. Thence the subluxation became more conspicuous when the patient, a very corpulent woman, attempted to stand on the limb, whereby the condyles of the femur abutted more prominently forward, showing that the ankylosis was loose and flexible. The patella was firmly ankylosed to the femur just above the outer condyle.

Considering this useless state of the limb, excision of the joint seemed justifiable, with the view of inducing osseous union, and restoring a useful member. But the continued recurrence of severe attacks of pain, affecting the patient's general health, and the otherwise incurable character of the disease, more immediately determined the propriety of operation ; while the prolonged duration of the joint condition, the necessity for interference ere the patient's constitutional reserve-power might prove insufficient for recovery after operation, and the relatively advanced period of life, admitted of no further delay.

Accordingly I had recourse to excision, notwithstanding the patient's age.

The report continues. August 10th, Mr. Gant performed the operation by his usual method :—A semilunar incision being made from the outer condyle of the femur downwards to just above the tubercle of the tibia, and upwards to the same point on the inner femoral condyle the joint was readily laid open. The osseous ankylosis of the patella was sawn through, in order to raise that bone, and the femoral section made so as to remove about one inch and a quarter of the articular end of the bone; then the articular surface of the tibia was removed to the extent of about half an inch, this section corresponding to the margin of the incision. Lastly, the patella was dissected out. Hæmorrhage soon ceased, or was easily arrested as usual, by torsion of two or three articular branches, exposure and cold water. By straightening the limb the ends of bone were seen to be in easy, parallel apposition. The double splint Mr. Gant is accustomed to use was then applied. Any clots of blood were afterwards thoroughly sponged out of the wound, and finally the exact apposition of the bones having been again ascertained, the integument was laid down and the incision evenly closed by six or eight points of silk suture. Strips of lint, soaked in carbolic acid solution, were overlaid and to a sufficient thickness for a compress; this was encapsuled in oil-silk, and the whole retained by a small roller-bandage.

After the operation no unfavorable symptom occurred of consequence. Primary union went on, except, as usual, at the angles of the wound, which gave issue to a moderate amount of oozing serous discharge; and in three weeks the line of incision had become soundly united. In the course of a week or two the patient was allowed, by her own request, to sit up in bed, reclining on a back support. *Seven weeks* after operation the splints were removed; firm union of the bones was found to be established, with the limb, in a perfectly straight position. But the patient could not yet raise her leg from the bed. Apparatus reapplied.

October 4th.—The patient was carried from bed, and permitted to sit up for some hours, the limb in splints resting on two chairs. She was suddenly attacked with erysipelas,

which, commencing in the foot and leg, spread up the thigh, sparing the front of the knee. The whole limb became of a deep red or purple colour, and enormously swollen, tense and brawny, accompanied with great constitutional disturbance, so that for some weeks her life was in danger. The ordinary treatment was pursued, excepting not having recourse to incisions. Vesicles and bullæ formed and broke, and a persistent oozing discharge of serum gradually relieved the extensive infiltration, although some patchy sloughing of the skin ensued; and the erysipelatous inflammation extended further up above the buttock to the loins, and round to the lower part of the abdomen. Eventually the limb remained in a state of great œdema.

During the course of this attack, the splints having been necessarily removed, the limb gradually became slightly bowed outwards at the knee, yet the union remained firm, and the incision never reopened or gave issue to any discharge. Oxide of zinc was powdered over the whole surface, forming a kind of casement which absorbed the moisture, and seemed to stimulate its internal absorption. The œdema subsequently yielded to bandaging, aided by the horizontal position of the limb. At length, December 16th, a starch bandage was applied, and on the 21st, or little more than four months after operation, the patient went home to Dunstable, with instructions to return for examination in about a month.

State of the limb, January 24th, 1873, five and a half months after operation.—Union firm and immovable. The bowed appearance at the knee is corrected. Measurements of the limb are as follows:—*Length* $32\frac{1}{2}$ inches, sound limb $35\frac{1}{2}$ inches, or 3 inches shortening as the result of excision; *circumference* of knee $15\frac{1}{2}$ inches, of sound knee $14\frac{1}{2}$ inches, or 1 inch more after excision; the calf $12\frac{1}{2}$ inches, and at the same level of the calf in sound limb 13 inches, or only $\frac{1}{2}$ inch less after operation; the thigh $19\frac{1}{2}$ inches, and at the same level of the thigh in sound limb, 21 inches, or $1\frac{1}{2}$ inch less after operation. The functional use and power of the limb may be thus estimated at the

period referred to: the use of the limb for support in progression is not yet perfect; but the patient can bear her heavy weight upon it, and can walk with the aid of a stick; the power of the limb, according to its muscular development compared with that of the other limb, is indicated by the circumferential measurements of the calf and thigh. As the limb is brought into more active use there cannot be a doubt that it will become even more nearly equal in respect to its size and strength.

Proceeding to comment upon the particulars of this case, some of them seem to be more especially suggestive.

First, the kind of disease submitted to excision was, I believe, almost entirely exceptional to previous experience. In the histories of 100 cases collected by Mr. W. P. Swain, and which represent the majority of the cases operated on by Sir William Fergusson and some other surgeons of experience, no allusion whatever is made to rheumatic affections, except in two instances. Of one of these cases (No. 84) the briefest description is given—that it was “rheumatic disease of the knee-joint,” of no specified deviation, that the result was recovery, but that of this case “no notes were taken.” In the other case (No. 92) the patient had been attacked with “acute rheumatism” twenty years previously, but that “she used the limb until eighteen months ago, when she fell, sprained and struck the knee, and since that the limb has been useless.” The result of operation was recovery with a useful limb. In a series of 39 cases of knee-joint excision by Professor Humphry, recorded in the ‘Transactions’ of this Society (1869), in no instance was the “nature of the disease,” as described, in any way connected with rheumatism. A similar exclusion prevails in 12 cases by Mr. H. Lee, as recorded in the same volume of ‘Transactions;’ and also in the histories of 31 cases collected by Mr. Butcher, and in a second collection of 51 cases (‘Operative and Conservative Surgery’).

One case only of excision of the knee-joint has come to my knowledge, wherein the operation has been performed for chronic rheumatic arthritis; it was in the practice of

Mr. Curling at the London Hospital, and the result was successful ('Lancet,' 1869).

Secondly, the age of the patient in my case is, I believe, the most advanced period of life at which excision of the knee-joint has hitherto been performed. In Mr. Curling's case the patient's age was only 23 years. From the various series of cases already referred to I have gathered the most advanced ages at which the operation has been performed for other conditions of disease and the results.

It appears that excision of the knee-joint for disease, as performed in 13 cases between the ages of 32 and 47 years, has yielded 7 successful results; and that between the ages of 41 and 47 years there were 11 cases with 6 successful results. If then my own case, at the most advanced period of life, be superadded, we have a total of 12 cases, with 7 successful results, between the ages of 41 and 53 years. With regard to the question of mortality; in one of the unsuccessful cases of excision, amputation afterwards was followed by recovery, thus making a gross total of 8 cases out of 12, or an average of 2 recoveries in every 3 cases; and if the accidental deaths by embolism on the eightieth day, and phthisis, be omitted the recoveries rise to 8 in 10 cases, or 4 out of 5—a proportion fully equal to the successful results of amputation of the thigh for chronic disease of the knee-joint; with the advantage in favour of excision, that the limb is preserved.

Looking at all these cases of knee-joint excision for disease, two conclusions may be drawn; the one as to the extreme rarity of this operation for chronic rheumatic arthritis; the other that the operation may possibly be performed with safety and advantage at a much later period of life than it has hitherto been commonly practised. The result of the case I have brought forward would more especially suggest an occasional extension of the operation, both in respect to the kind of disease and the period of life which may be appropriate, thus embracing a larger class of cases beyond those hitherto recognised as suitable for excision.