DUPUYTREN'S FRACTURE OF THE FIBULA.*

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THE case which I am about to describe I have set down as an example of Dupuytren's fracture, although that expression does not fully indicate the whole injury, which, in addition to a fracture of the fibula, includes complete internal dislocation of the tibia at the ankle, and ascent of the foot. But I thought that I might follow the habit which in this kingdom has given the title "Pott's fracture" to an injury which is of the same class, but not so exaggerated; the only difference being that in one the tibia is completely dislocated, with resulting displacement of the foot upwards, and in the other partially. Besides that, however, Dupuytren gives authority for this course; for he observes: "By fracture of the lower extremity of the fibula, I mean such solutions of continuity of this bone as occur sufficiently near to the ankle-joint to involve, as a consequence of the same proximate cause (be it the weight of the body or the action of the muscles) dislocation of the foot inwards, outwards, or even backwards. The fracture is thus the primary and principal lesion, without which there would be no dislocation. The fibula may be readily fractured without dislocation being entailed, but the latter cannot be produced without the prior occurrence of the former." (*On the Diseases and Injuries of Bones*, Sydenham Society.)

The details of my case may be briefly told. Three years ago, an old woman, about 65, while stepping on to a pathway, slipped upon some mud and fell, fracturing her left fibula near the ankle, and dislocating her tibia inwards. Two days afterwards, she was brought to the Nenagh Workhouse Hospital. Dr. Minnitt, under whose care she was, informs me that the tibia protruded inwards through a wound in the integuments, the fibula was broken at the usual situation, and the foot was dislocated outwards. The dislocation was reduced, but severe sloughing set in; there was profuse suppuration nearly as far as the knee-joint; and it was not possible to keep the bone in position. After a long illness, the patient recovered, but with the deformity shown in the cast. Amputation was proposed, but she left the hospital, and was not again seen by Dr. Minnitt.

In December 1878, she was transferred to my care from the North Dublin Union Hospital by my friend Professor Minchin. The condition of the limb was as is well shown by the cast. The tibia projected inwards and downwards, the end of it being a rounded knob with the skin tightly stretched over it. On the outer side, there was a depression about an inch above the tip of the malleolus, indicating the seat of fracture. The whole foot was everted, the toes pointed downwards, and the outer edge of the sole was raised, giving the sole an outward aspect. The ankle-joint was quite immovable. The toes touched the ground, but she was unable to support the weight of her body; and she begged urgently to have the foot removed. The prospect of success being favourable, I removed the leg by Hey's method, dividing the tibia and fibula at the middle of their length.

In making a subsequent examination of the parts with my colleague Dr. Corley, we were able to recognise one of the rarest injuries, to which Dupuytren was, I believe, the first to call attention. Special reference is made to it by the late Mr. Robert Adams of Dublin, in his article "On Abnormal Conditions of the Ankle-Joint" (*Cyclopædia of Anatomy and Physiology*), but the injury does not receive attention in the ordinary works. In his chapter on fracture of the fibula, Dupuytren refers to the injury as one of the complications of fracture of the fibula, and describes it as a dislocation of the foot outwards and upwards. "This form of displacement," he observes, "is so rare that I have only seen it once in nearly two hundred cases of fractured fibula which have fallen under my observation during the last fifteen years. It involves not only fracture of the fibula, but also laceration of the strong tibio-peroneal ligaments, which generally resist a force to which the osseous tissue itself yields."

The signs present in that case were "shortness of the leg, together with the almost doubled interval comprised between the malleoli and the prolongation of the tibia downwards to a level with the sole of the foot. The astragalus and outer malleolus, with the whole foot, were drawn up on the outer side of the tibia, two inches above their normal position. All these signs left no doubt that the ligaments connecting the tibia and fibula were torn through, and that the foot was dislocated outwards and upwards, carrying with it the outer malleolus" (see Fig. 1).

The specimen I submit presents all the conditions necessary for dislocation of the foot upwards and outwards, as it is sometimes called (see Fig. 2). The tibia is dislocated completely inwards, and its arti-

cular depression and the inner malleolus are represented by a rounded extremity. The outer side of this, just at the end, is ankylized to the inner superior margin of the astragalus. Between the end of the tibia and the astragalus is a small piece of bone (c, fig. 2) which is evidently

Fig. 1.—Dupuytren's Original Case.

Fig. 2.—Mr. Thomson's case.—a. Lower Fragment of Fibula; b. Upper Fragment of Fibula; c. Portion of the inner Malleolus; d. Superior Articular Surface of Astragalus, directed upwards, forwards, and inwards.

the tip of the inner malleolus. At the time of the accident this was torn off and was held *in situ* by the internal lateral ligament, the tibia being thus allowed to depart from its articulation with the astragalus. The fibula has been broken about an inch above the malleolus, and being bound to the tibia the shaft, has followed the direction of that bone somewhat inwards. The foot has been drawn up so that the posterior part of the articular surface of the astragalus is fixed to the lower end of the upper fragment, leaving about three-quarters of an inch of articular surface free in front. The outer malleolus is firmly attached to the outer surface of the astragalus. We have, then, this order of parts: the tibia inside, then the upper fragment of the fibula, resting upon the astragalus between the tibia and the outer malleolus. A specimen similar to this exists in St. Thomas's Hospital Museum, and is figured in Sir Astley Cooper's work (see Fig. 3);

Fig. 3.—Specimen in St. Thomas's Hospital Museum; from Sir Astley Cooper. another was obtained by M. Richet, and is figured in Anger's *Maladies Chirurgicales*, page 311; but I am not aware of any other recorded specimens in the museums.

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Mr. Robert Adams, in his article on the ankle-joint, reproduces Dupuytren's original case, as well as the St. Thomas's Hospital specimen, as examples of the same injury, and observes: "The preservation of this specimen, which, in our mind, is a true example of the complete dislocation of the tibia inwards, and of the external malleolus, astragalus, and foot upwards and outwards, is a new proof of the truth of the observation we have above made, that this severe accident has not altogether escaped the notice of English surgeons, although the *Annuaire* contains the first accurate account of the external signs by which it may be recognised in the living subject".

Dupuytren believed that the dislocation upwards was due to the separation of the fibula from the tibia; but an examination of his illustration does not confirm that view. To me, it is obvious that the direction of the upper portion of the fibula is parallel to the displaced tibia, and I have no doubt that, in the case referred to, the foot ascended between the tibia and the lower fragment of the fibula, until it was stopped by the lower end of the upper fragment of that bone. That the foot ascended two inches depended upon the site of the fracture. It is plain from the depression figured that the fibula was broken two or three inches above the tip of the outer malleolus, and so permitted the foot to pass upwards to the distance mentioned. It is very difficult to conceive a separation to such an extent between the fibula and the tibia, for they are bound together by strong ligamentous and muscular attachments; and in the case figured by Cooper, we notice that the ligament at the lower part proved stronger than the bone, for a slip of the tibia has been torn off and remains attached to the outer malleolus.

Although museum examples of this injury are rare, I believe that it occurs more frequently than is supposed; and that, wherever there is complete dislocation of the tibia inwards, with preceding fracture of the fibula, the latter bone follows its fellow inwards, and the foot is drawn upwards by the strong muscles of the calf. I have seen one such case while house-surgeon. The patient was a carpenter aged 60, who slipped off a path, and broke his fibula about one inch and a half above the malleolus. He tried to walk, but with the result that the tibia was dislocated inwards. When he was brought to hospital, this bone was projecting through a sharply margined transverse tear in the soft parts, over the situation of the internal malleolus. The articular surface of the bone was on a level with the sole of the foot, which was everted. There was a deep depression over the seat of fracture, and increased width between the malleolar points. I succeeded in reducing the dislocation, but abscesses and necrosis followed; and after fourteen months, the patient left the hospital with a stiff joint. With such an injury, so long as the muscles act, the foot must ascend until it is stopped by the upper fragment of the fibula, the amount of shortening depending upon the length of that fragment.

ON NERVE-STRETCHING AS A REMEDY FOR SCIATICA.

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THIS operation was first introduced by Professor Nussbaum of Munich; but, judging from the paucity of recorded cases, it does not seem to have recommended itself to British surgeons. The probable reason for this is, that it has little of an attractive character, and, when looked at superficially, everything seems against it. For why, it may reasonably be asked, can we expect benefit from rudely dragging at a nerve inflamed or in a state of superexcitation? Everything, however, must be brought to the test of experience; and, when tried in this manner, Nussbaum's operation will be found a most valuable addition to our other appliances for combating a malady proverbially obstinate and sometimes intractable.

In dealing with cases of sciatica, it is of the utmost importance to determine as accurately as possible what is the origin of the disease in any given case; for the causes are so diversified, that the employment of any favourite remedy for all is simply absurd and empirical. Let us consider for a moment what these causes are, and we shall see at a glance that each case must be treated with discrimination, and always with an eye to its origin. As causes, we have the following: pelvic tumours; caries of lumbar vertebrae; impactions of scybala in the caput cæcum coli; inflammatory infusion in the pelvis, resulting from pelvic cellulitis or pelvic peritonitis; and last, but not least, rheumatic inflammation of the sciatic nerve itself from exposure to cold and wet. Of all these, the last named is by far the most common; and it is just in such cases that nerve-stretching proves most efficacious.

What the exact nature of the effect of this operation is in all cases, I am not prepared absolutely to assert; but if, on stretching the sciatic

nerve, one feel adhesions giving way, one may be tolerably certain that the patient will be greatly benefited, if not cured. We may infer from this, that the disease is often kept up by adhesions between the nerve and its sheath, the result of a neuritis, which a free stretching generally removes. Besides, there can be little doubt that the counterirritation produced by a large wound, which not infrequently suppurates, must have a very powerful revulsive effect on the inflamed condition of any nerve in its immediate vicinity. The prompt relief, however, which follows the operation in some cases certainly cannot be accounted for by this latter supposition, but can easily be explained on the assumption of existing adhesions having been ruptured.

The operation is a very simple one, and not for a moment to be compared with the sufferings of some sciatic cases. Such, at least, is the opinion of the patients themselves, who are but too glad to submit to a second operation when necessary.

The nerve is generally sought for between the great trochanter and the tuberosity of the ischium; but it is more easily found in another quarter; and, besides, the course of the nerve here is not sufficiently central for efficient stretching. The plan I follow is that of Dr. Joseph Bell of Edinburgh. Make a straight incision four inches long in the middle of the thigh, on its posterior aspect; cut through the skin, fat, and fascia; separate the hamstring muscles with the finger; and the sciatic nerve will be easily found on the inner side of the biceps and somewhat overlapped by that muscle. Its sheath being opened by a touch of the bistoury, it is now raised on a blunt hook, then caught by the finger, and the whole leg lifted off the table. The wound is then brought together by wire sutures, a drainage-tube inserted, and a layer of lint soaked in carbolic oil (1 to 12) placed over it. As may well be supposed, there is rarely union by the first intention.

CASE I.—W. J., plasterer, a strong healthy young man, after working in a cold draught for some days, was seized with a severe attack of sciatica in his left leg. He was admitted to the Perth Infirmary, and subjected to treatment for about a month without any permanent benefit. The following remedies were employed: turpentine internally; iodide of potassium; calomel and opium; wet cupping; subcutaneous injections of morphia and chloroform; faradisation with the primary current and metallic brush; blisters; etc. The results were very discouraging and he left for the Edinburgh Infirmary, where Nussbaum's operation was performed. The relief obtained by it, however, was very transitory; and our patient returned to Perth in much pain, and quite unfit for any work. I determined to repeat the operation. He returned to the infirmary; and I cut down upon the nerve in the middle third of the thigh through the cicatrix of the first operation, and there found it adherent to its sheath, the latter being much thickened from effusion of plastic lymph. I hooked up the nerve with my index finger, and stretched it freely, breaking up adhesions not only at the seat of the first operation, but also in parts of the nerve more remote. The wound was brought together by silver-wire sutures; a drainage-tube was inserted; the whole being covered by a pledget of lint soaked in terebene. The progress of this case was uninterrupted, and in six weeks the patient left the infirmary perfectly cured of his sciatica and able for steady work. It is now six months since then, and there has been no return of his old disorder.

REMARKS.—I have no doubt that the cause of failure of the first operation in this case was extensive adhesion between the nerve and its sheath at the seat of operation, such adhesion necessarily keeping up a constant strain and drag on the nerve in all movements of the leg. An accident of this kind might be avoided, by instructing the patient to flex and extend the leg several times daily while the wound is healing.

CASE II.—George W., brassfounder, a healthy muscular man, had always enjoyed good health till December 1877, when he was admitted to the Perth Infirmary for an acute attack of sciatica in the left leg. He believed that it originated in a chill, after being overheated with his work. He was purged freely, and put on five-grain doses of iodide of potassium, the severe pain being relieved by subcutaneous injections of morphia at night. These means failing, an alkaline mixture with vinum colchici was substituted; then turpentine purges, but with little benefit.

With the patient's consent, I now determined to stretch the nerve, and accordingly cut down upon it in the same position as the former case. Its sheath seemed natural at the seat of operation, and I could not perceive any hyperæmic condition of the nerve itself; but, on stretching it, adhesions in some part of its course were felt giving way. The wound was dressed in a similar manner to case I, but, owing to the premature removal of the drainage-tube, a false healing took place. The temperature rose to 103° Fahr., and a good deal of constitutional disturbance followed. All this, however, disappeared so soon as the wound was reopened, the pus evacuated, and the tube replaced. His progress was now uninterrupted, and the recovery everything that could.