LENGTHENING OF HAMSTRINGS BY OPERATION FOR CONTRACTURE AFTER BURN.

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D. H., aged 14 years, was admitted in February, 1899, for contraction of the left knee-joint, due to a burn at the age of 3 years. An extensive cicatricial web stretched from the middle of the leg to a point two-thirds of the way up the thigh, preventing extension beyond a right angle. The head of the tibia was displaced backwards and outwards, the condyles of the femur standing prominently forward. The patella was about half the size, and the anterior surface of the tibia about half the width of those of the other leg; the tibia and fibula, however, were not shortened. He walked with a crutch, the toes only of the left foot reaching the ground.

On March 10th the web was dissected away and fascial bands divided, allowing the knee, with a little force, to be extended to about 135 degrees. Further straightening was impossible without dividing the hamstrings. The biceps tendon was split for 3 inches near its insertion, divided and sutured as shown in Figs. 1 and 2, *b, b'*. The inner

Fig. 2 Fig. 1. Fig. 3.

hamstrings, which were too attenuated to be split with safety, were divided transversely at different levels 3 inches apart (Fig. 1, *T T'* and *M M'*). The proximal end of the semi-tendinosus, which had been cut at the lower level, was sutured to the distal end of the semi-membranosus, which had been cut at the higher level (Fig. 3, *T M'*). The other ends were shunted into their neighbours and sutured (Fig. 3, *M* and *T'*). Further extension was still impossible, owing to the shortening of the popliteal nerves and gracilis, but especially the former. It was decided to overcome these by gradual weight extension. The wound was then covered in as far as possible by undermining the surrounding skin and facing the edges towards each other. This had the effect of completely covering the sutured tendons. The limb was put up in a semi-flexed position on an angular splint.

The wound was dressed on March 18th, the stitches removed, primary union having taken place where the skin edges had been made to meet. Extension from the ankle was now adopted, a 5 lb. weight being applied.

On April 1st the knee was only about 15° from the straight line. The popliteal space presented a large granulating wound. Two days later flaps were raised on either side of the patella and laid across the popliteal space. A fortnight later a similar flap was lifted about 4 inches higher and the upper part of the popliteal space completely covered in. He was discharged on June 3rd with the knee straight, but wearing a Thomas's knee splint and pattern. He dispensed with these a fortnight later, and when seen again in September had complete range of flexion and extension.

On February 15th, 1900, when shown at the clinical meeting of the South Wales Branch of the British Medical Association he walked without a limp and without the slightest effort.

The interesting features of this case are the unexpected ease with which the marked displacement backwards of the head of the tibia was remedied, and the means adopted for lengthening the hamstrings. Splitting is the preferable method, but for the reason mentioned it was considered inadvisable in the case of the inner hamstrings. The mixed action of the muscles, resulting from the procedure adopted, was deemed of little importance in view of the displacement already existing at the joint. And although this displacement has been fully reduced, the power of flexion has not perceptibly suffered. That lengthening is preferable to simple division in contracture of the hamstrings is obvious. The result of the latter is uncertain, loss of power being probably the rule rather than the exception.

FIVE CASES OF COMPLETE FORWARD DISLOCA- TION OF THE KNEE-JOINT OCCURRING SIMULTANEOUSLY.

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THE following five cases of true dislocation of the knee-joint may be interesting to readers of the BRITISH MEDICAL JOURNAL, not alone on account of the rarity of the accident, but the fact that all the injuries occurred at the same time, which is, I believe, unique. I would also draw attention to the results, which are, I think, instructive, and which to a certain degree may be of assistance in the prognosis of similar cases.

The accident which caused the injuries occurred at the Shipley Collieries, Derbyshire, on April 26th, 1899. A cage in which eighteen men were being lowered into the pit, 200 yards deep, ran away—that is, the engineman lost control of his engine when the cage was about 60 yards from the bottom. Consequently the men were precipitated down the shaft at a terrific speed, which was stopped by the impact at the bottom. At the bottom of the shaft is a hole filled with water called the "sump hole." Across this hole are placed thick planks on which the cage rests when let down. The cage has also two platforms, an upper and lower. The men during transit stand in a rather stooping posture, with, I believe, the legs straight and head and shoulders bent. The dislocations occurred on both platforms. The cage on reaching the planks crashed through them and got jammed before going deeper.

In consequence of delay in reaching the injured men, the miners belonging to the ambulance fixed the injured limbs in temporary splints, and in due course they were conveyed to the Ilkeston Cottage Hospital two miles off. For the sake of clearness I shall describe each case. All the injured men are miners.

CASE I.—F. W., aged 30.

Condition of Joint.—On superficial examination of the right knee-joint, I was puzzled as to the exact nature of the injury; the deformity was so great. On closer examination the condyles of the femur were seen to be very prominent, projecting backwards, so that the skin behind the joint seemed ready to burst. The head of the tibia together with the fibula was shot up on to the anterior surface of the femur for quite 2 inches. The effusion, curious to say, was slight.

Reduction.—Under an anæsthetic the dislocation was easy of reduction in the following manner: Facing the patient's feet, traction on the foot was made by one operator, the other used the fingers of both hands on the condyles behind as a lever while the thumbs in front forced the head of the tibia into its place without difficulty.

After-treatment.—The immediate after-treatment consisted in placing the joint on a cushion, without splints, in the position of greatest comfort, and applying hot anodyne fomentations.

After the injury had been diagnosed in one case it was easy of recognition in the others.

CASE II.—J. T., aged 27. The deformity in this (left) limb was the same, only not so well marked, the limb being much more fleshy than in Case I. The dislocation was exactly similar, but in addition this man's skin was split across the back of the joint for the whole width, but the wound did not open into the cavity of the joint. There was a large amount of effusion, and also a considerable amount of ecchymosis from the hip to the ankle.

Reduction was easily effected in a way similar to that adopted in Case I, and the after-treatment was the same.

CASE III.—C. E., aged 33. This case was similar to Case II. The left knee was split across the back of the joint, and there was great effusion and ecchymosis.

Reduction was easy, and the same after-treatment was adopted.

CASE IV.—T. B., aged 21. This case was rather different to the others, owing to the fact that he sustained an oblique fracture of the tibia as well as dislocation of the knee.

The skin was split at the back of the joint in the same way as in Cases II and III. Having reduced the dislocation without trouble the fracture presented some difficulty owing to its obliquity. It was found necessary to put on extension in order to keep it reduced. After about ten days this was replaced by plaster-of-paris. The ecchymosis and effusion into the joint was in this man very great, the former extending in one continuous broad black patch from the great trochanter to the foot.

This was the only really bad result; the man at the present time has a flail joint. He has also got paralysis of the extensor muscles of the foot owing probably to some injury to the anterior tibial nerve at the time of the accident. I have no doubt that the result was not improved by the extension, which was absolutely necessary in order to keep the fracture reduced, but was, I think, the lesser of two evils. He has not improved under electricity and massage.

CASE V.—T. C., aged 20. The dislocation (left knee) was the same as the previous cases. The effusion was large in amount, as was also the ecchymosis. The skin was not ruptured at the back of the joint. The dislocation was easily reduced, and the after-treatment was the same as before with the exception that the joint was put up in plaster-of-paris three weeks after the accident. The man got out of bed before he was allowed and tried his weight on the joint, which shot out of place and appeared to be quite useless.

Gentle movement was commenced in all the cases, except IV and V, at the end of a fortnight.

As soon as the men were allowed to move about without crutches I had leather kneecaps made for them, extending well above and below the joint and laced on the outside. These they wore for about three months, some two only, then one by one they discarded them, although they were told that they ought not to leave them off for twelve months, which treatment is in accordance with my teaching. However, colliers will be colliers, and usually under any treatment which becomes irksome will take the reins into their own hands and do as they like. The result in this case being that all the men (except Case IV, who does not improve) were at work under five months from the date of the accident with practically sound knees of the same appearance as before, and of equal usefulness.

I often ask the men if they feel anything of the knee. The answer is invariably "when there's a change in the weather," but the fact remains that they can walk well both above and below ground, and do collier's work, which is no sinecure. The roads in pits are often very stony and uneven, and are in consequence more injurious to a knee-joint than any other, notwithstanding which I have only had one man consult me since they started work (Case III), and that was soon after he began. A few more weeks' rest put him right, and he has not missed a day's work since he once got properly started.

What exactly happened to the ligaments of the respective joints, especially the internal ones, it is not quite possible to say. Undoubtedly the crucial ligaments were ruptured, as the joints appeared to be "flail-like" for some weeks after the injury. In Case IV the knee is still quite unsteady and loose, although he can walk with a support. That the ligaments were to a great extent repaired there can be no doubt, as the men have useful and firm joints with perfect extension and flexion, otherwise they could not do miner's work.

One man, named J. N., aged 45, had his right leg broken just above and below the knee-joint, also about 4 inches above the ankle, but the knee-joint appeared to be uninjured. This would, perhaps, point to less elasticity of bone than in the younger men. Several others had synovitis of the hip, knee, or ankle-joints.

In conclusion, I have to thank Dr. Willis, M.O.H. of Ilkeston, for valuable aid in reduction and in the after-treatment of the cases.

TWELVE CASES OF MAUSER BULLET WOUNDS.

By GEORGE ASHTON, M.B.Vict.,
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THE Mauser, which is the official bullet of the Boers, is 1.21 inch in length, weighs 172.83 gr., and is 0.275 inch in diameter. It leaves the rifle with a muzzle velocity of 2,380 feet per second, and the bullet while passing down the rifle barrel makes one complete turn to the left in every 9 inches. It is interesting to note for purposes of comparison that the

Lee-Metford bullet, Mark II, used by our troops in South Africa is 1.25 inch in length, weighs 215 gr., and is 0.303 inch in diameter. It leaves the muzzle of the rifle with a velocity of 2,000 feet per second, and the bullet while passing down the rifle barrel makes one complete turn to the right in every 10 inches. The following cases of Mauser bullet wounds are examples of the injuries met with in the present campaign:

CASE I. *Penetrating Wound of Thigh*.—Sergeant —, aged 31, of the King's Royal Rifles, was wounded at Spion Kop on January 24th. He was running to the attack to take a machine gun from the Boers when he was hit in the right thigh. He fell down and bled profusely. He commenced to apply his pocket field dressing when another bullet knocked his helmet off, so he left the dressing alone and lay perfectly still for seven hours, being within the zone of fire all this time. He was then found by the ambulance party and carried four miles on a stretcher to the field hospital. He was admitted to the *Nubia* on January 25th. There was a small black scab on the front of the right thigh, almost exactly in the line of the femoral artery and 2 inches below the middle of Poupart's ligament, and another black scab precisely similar in appearance in the middle line of the back of the thigh and 1 inch below the gluteal fold. He had no constitutional disturbance, took a full hospital diet, and complained of no pain. The scabs came away on February 4th, leaving small cicatrices. He resumed his duties at the front on March 9th, and said his leg feels as strong and well as ever.

CASE II. *Penetrating Wound of the Chest*.—Lieutenant —, aged 25, of the 1st Border Regiment, was wounded at Colenso on December 15th. He was superintending the working of a Maxim gun, when he was hit in the left shoulder. He compares the pain to that of being struck with a large stone. He stood up, in a dazed condition for 30 seconds, but felt a great tightness round his chest, gasped for breath, and began to cough up blood. He fell down and remembers being placed on a stretcher, but then fainted. When he recovered consciousness, he was in an ambulance wagon. He coughed blood for 10 days. Emphysema appeared, extending from the lower costal margin to the clavicles, and was especially marked in the left axilla. All the emphysema disappeared in 7 days. The x rays were used and the bullet was localised and removed 14 days after the receipt of the injury on the inner side of the right armpit. He was admitted to the *Nubia* on January 10th. There was then a small cicatrix on the outer side of the left deltoid, 1½ inch below the angle formed by the junction of the spine of the scapula and acromion and so slightly posterior to the humerus. There was a linear cicatrix ¾ inch long on the inner side of the right axilla over the third and fourth ribs. There was no sign of emphysema, no pain on taking a deep breath, nothing abnormal on auscultation or percussion of the lungs. He was very short-winded, even on slight exertion, and had attacks of spasmodic coughing, but no expectoration. Sir William Stokes, when on a visit to the *Nubia*, saw this case, and was literally amazed at the course this bullet must have taken amongst the large blood vessels of the heart. The patient was sent to England on February 2nd.

CASE III. *Perforating Wound in Neighbourhood of Elbow: Complete Recovery*.—Private —, aged 20, Durham Light Infantry, was wounded at Krauskloof on February 5th. He was lying on his face firing, when he was struck in the left elbow. He says it was not very painful, but his arm became numb and useless. He applied the pocket field dressing, and walked two miles to the field hospital. He was admitted to the *Nubia* on February 19th. There was then a small cicatrix on the posterior surface of the left upper arm, 2½ inches above and slightly external to the olecranon. The exit wound also quite healed, was on the anterior surface of the olecranon, rather inclined to the outer border, and 1½ inch below the elbow fold. There was no swelling and no pain in the left elbow-joint. The circumferences of the left and right elbow-joints were equal. The patient, who resumed his duties at the front on March 9th, said his arm was as well as ever.

CASE IV. *Bullet Wound of Pelvis*.—Private —, aged 27, of the West Surrey Regiment, was wounded at Colenso on December 15th. He was lying on his face firing, when he felt a sharp pain in his left side and also a simultaneous pain inside his right knee. He crawled eight yards to a donga (an empty watercourse), where the field dressing was applied by a comrade to the wound in his side. He then managed to walk 100 yards to a stretcher party, and was carried to the field hospital. For the next five days he passed blood in his urine and the bullet was removed from the inside of his right knee on December 26th. The x rays were not used. He was admitted to the *Nubia* on January 12th. There was a small cicatrix ½ inch above the left iliac crest and ¾ inch posterior to the left anterior superior iliac spine. There was a linear cicatrix 2 inches long on the inner side of the right thigh, the lower end of the cicatrix reaching to the internal condyle of the femur. The urine was free from albumen or blood, and he complained only of a cutting pain in the lower part of the abdomen when he coughed or took a deep breath. He was sent to England on February 2nd.

CASE V. *Perforating Bullet Wound of Chest*.—Private —, aged 30, of the Lancashire Fusiliers, was wounded at Spion Kop on January 24th. He was lying on his face firing when a bullet hit him in the back. He compared the pain to that of being struck by a brick. He at once began to cough blood, and continued to do so in small quantities for three days. The pocket field dressing was applied by a comrade, and he attempted to walk to the field hospital, but after walking ten yards he fell down and fainted, and was carried off by the stretcher party. He was admitted to the *Nubia* on January 29th. There was a small black scab exactly in the middle line of his back, and between the tenth and eleventh dorsal spines. There was another black scab on the right side of the chest, exactly 1½ inch below the right nipple. He had no spinal symptoms, the knee-jerks were good, and he had no paralysis, anaesthesia, or shooting pains in the legs. There was no cough, and the lungs to percussion and auscultation were normal. He complained simply of a general feeling of lassitude and weariness. He slept well and ate well. On February 4th he was allowed to walk a little about the wards, and the scabs came away. On February 10th he left for Netley Hospital.

CASE VI. *Bullet Wound of Back*.—Private —, aged 27, of the West Surrey Regiment, was wounded at Colenso on December 15th. He was lying on