HISTORY
OF
A CASE
OF
POPLITEAL ANEURISM;
WITH OBSERVATIONS.

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COMMUNICATED BY MR. QUAIN.

READ FEBRUARY 27TH, 1838.

THE following case occurred in the private practice of Mr. Hewson, surgeon to the Lincoln Hospital, to whose kindness I am indebted for the opportunity of observing it through its interesting course, and for permission to give it publicity.

July 16th, 1837.—John Asman, æt. 23, married, of fine muscular development, and possessed of great physical strength, was seized, about three months ago, with pain in his right leg and round the knee, followed by swelling. Formerly he was porter to a wine merchant, but had latterly been employed in a flour-mill; in both situations he was subject to violent exertions, in lifting and carrying heavy weights. His general health, with the exception of

a severe attack of rheumatism, which he had some years ago, had been remarkably good. The present affection, which he considered rheumatic, had never required the discontinuance of his employment, and he relinquished it at this time rather in compliance with the directions of his medical adviser, than from any inability to pursue it.

The right calf was much larger than the left, and at the lower point of the popliteal space was a well defined tumour, as large as an orange; on each side and below this was a more diffused tumefaction, merging into the gastrocnemial swelling; and not to be distinguished from it. There was distinct pulsation, synchronous with the heart, and clear bruit in the swelling, especially at the inner side of the calf. Pressure upon the femoral artery suspended the pulsation, rendered the tumour soft, and diminished its size. The heart and arterial system, examined with the stethoscope, appeared perfectly healthy. It was stated that the calf of this leg had been for some years decidedly larger than the other.

July 18th. Mr. Hewson placed a ligature upon the superficial femoral artery at the margin of the sartorius muscle. Before the patient was removed from the table, it was observed that the aneurismal tumour was as large as ever, and the tension greater than it was before the application of the ligature; there was, however, no return of pulsation. He suffered very severe pain, for a few seconds after the ligature was tightened, down the leg, and a slight irregularity of the pulse, not amounting to an inter-

mission, could be occasionally but infrequently perceived.

An hour after the operation, no pulsation could be perceived in the tumour ; but after three hours more it had returned with some force. Twelve hours after the operation the tumour did not appear quite so large as it had been, and was of the natural temperature ; it was, however, deemed expedient to envelop it in flannel. There was a regular, but indistinct pulsation in the tumour, which was not synchronous with the pulse.

19th. Was quite comfortable, and the leg and foot were warm. The integument over the tumour was yellow, tense and resistant ; when the hand was applied an indistinct but feeble pulsation could be perceived, and with the stethoscope an obscure, whizzing, prolonged murmur was heard.

24th. No reduction of the tumefaction and tension of the calf. During the night, considerable pain in the knee.

27th. Pulsation not perceptible in femoral artery below the ligature, but distinct in tumour at the ham, which was still hard and resisting. Not the slightest bruit could be heard in it by means of the stethoscope. The leg from the knee to the toes was beginning to assume an oedematous character, and had attained a greater size than it had before the operation ; round the widest part at the calf, its circumference was eighteen inches. The incision had perfectly healed by the first intention, except at the point where the ligature projected. The heat of the

leg was great, and at times he was subject to very great pain, beginning in the ham, extending to the knee, and proceeding down the leg, quite as severe as that he suffered before the application of the ligature. Frequent and profuse perspirations, attended with a sinking sensation, and depression of spirits.

28th. The superficial veins of the leg were distended and the œdema increased. The skin over the sac more yellow than it had been. The paroxysms of pain, though less frequent than before the operation, increased in severity.

29th. The attacks of pain still more severe. Temperature between the toes of each foot 101° Fahr. ; at the external surface of the calf, which was in contact with the bed, 102° ; the same part of the unaffected leg, 98° . On applying the fingers to the middle of the thigh we discovered a pulsation, and with the stethoscope traced a distinct arterial bruit along the inner side of the thigh in the course of the artery, from about three inches above the knee to the groin, least audible at the lower part, and gradually becoming more loud to a little above the ligature, where it was very strong and distinctly heard. The integument over the tumour in the ham had a blush of inflammation upon it.

30th. Had been free from pain since the previous afternoon. There was a slight diminution of the shining and blush upon the integument. The bruit along the course of the femoral artery was still audible, but we could not find any pulsation. Pressure

upon the artery at the groin completely suspended the pulsation, recognizable in the sac, and produced some decrease of its bulk ; pressure about the middle of the thigh, where the bruit was heard, did not produce this effect. The temperature of the limb was nearly natural, $98\frac{1}{2}^{\circ}$ between the toes, 98° about the calf.

A few minutes after 10 P. M. bleeding was observed from the wound. When seen about half past ten, it had ceased. The cicatrix was entire, except the small opening from which the ligature depended. The quantity lost was estimated at about ʒviiij , and was quite florid. The pulsation at the tumour was evidently less than in the morning. There was some puffiness around the cicatrix, and about an inch and a half to the outer side, a distinct pulsation. It was determined not to interfere farther than to make pressure at the part, with a pad of lint and strips of adhesive plaster, and to apply cold.

31st. At five o'clock this morning there was a slight escape of blood, not more than an ounce. About twelve at noon the hemorrhage returned with such violence that an arterial jet was forced out between the dressings to some distance. It was decided that the femoral artery should be tied again immediately below Poupart's ligament, which was accordingly done by Mr. Hewson.

The ligature was firmly tied, and the beating previously observable at the seat of the former ligature, and in the surrounding tumefaction of effused blood immediately ceased. It was also thought the aneu-

rismal sac and calf were less distended; the pulsation in the former, and the bruit along the course of the femoral artery, were stopped.

In the evening it was found that there had been a slight oozing of blood from the situation of the first ligature, and in the surrounding tumefaction, which was reduced in size, a decided pulsation could be felt, and, with the stethoscope, a faint bruit. The calf being measured at the same place as before, shewed a diminution in circumference of half an inch since the previous morning. The tumour was decidedly softer, and no impulse could be perceived with or without the stethoscope. The surface of the limb was more of the natural colour, and the veins, though swollen, were not observable unless special attention was directed to them. Temperature between the toes 90° , gradually rising as the instrument advanced up the leg, and at the calf the mercury stood at 102° .

August 1st. The temperature between the toes was 86° , at the ankle 95° , at the calf 100° . The tumour and the skin of the leg were more relaxed; pulsation diminished; bruit no longer perceptible with the stethoscope.

2d. Up to eight o'clock this evening he had been remarkably comfortable, the leg quite easy, and his spirits improved. At this period the bleeding suddenly recurred from the wound in the thigh where the first ligature had been applied. Pressure immediately above the wound controlled it, but, as soon as it was removed, the blood, in a stream as large as a

quill, was projected upwards a foot and a half. The cicatrix was laid open, and an ineffectual attempt having been made to find the mouth of the bleeding vessel, amputation of the limb was immediately performed. The upper part of the artery was found to be quite separated from the lower, upon which the ligature still remained, and to present an open mouth.

The operation was followed by great collapse, faintness, but not to syncope, and vomiting. He was covered with blankets, warm water was applied to the foot, and brandy, ammonia, and opium having been administered, the patient slowly revived. The temperature between the toes while the hemorrhage was going on was 90° , having increased 4° since the morning.

3d. The countenance was more composed and animated but pallid; there was a slight return of rosiness in the previously livid lips; pulse 125, very much improved in volume and strength.

6th. Pulse 84. The dressings were partly renewed at the stump, and some offensive matter removed. The wound in the groin had a healthy appearance.

21st. Up to this period his progress had been most satisfactory; he had very much improved in health and appearance, and his pulse for some days previously had been only 70. He had been allowed half a pint of porter and two glasses of wine daily, a few days before. At four o'clock in the morning the wound at the groin was observed to bleed; the

blood was florid and arterial, and did not come away in a full stream, but gently oozed up, and apparently did not amount to more than five or six ounces. A compress of lint and adhesive plaster was applied. Digitalis was given, and his generous diet gave way to one of milk.

At 11 A. M., there was a return of hemorrhage to a greater extent. The pulse was full and bounding. It was proposed to tie the external iliac artery, and secure the epigastric and circumflexa ilii; but the patient would not consent. He was therefore bled in the arm till the pulse became smaller and weaker, and a bladder containing salt and ice, pounded together, was applied over the groin.

About six o'clock in the evening a slight discharge of blood took place, and later at night the pulse rose in volume and strength. The blood removed in the morning presented a thin buffy coat.

22d. A very large and alarming bleeding suddenly burst forth at six o'clock P. M., which produced a frightful effect, and placed the poor fellow in greater jeopardy than he had ever apparently been before. At his request, the operation was therefore instantly performed; brandy having been first given in small but frequently repeated doses.

The mode adopted by Sir A. Cooper was followed. When the peritoneum was arrived at, the epigastric artery was nearly exposed at the lower part of the wound, and by a little careful dissection, was cleared and tied, the subjacent membrane having sustained no injury. The peritoneum was then drawn to the inner side of the wound along with the cord, and the

external iliac having been brought plainly into view, an armed needle was passed beneath it, and the ligature securely tied. The pulsation at the groin ceased. He vomited several times during the operation, although brandy and ammonia were frequently given, and the state of collapse, and diminished vitality, more than once gave rise to fears that the point, so warmly contested, would be lost ere this important measure could be accomplished. He rallied, however, and at ten o'clock was comfortable, the stomach having retained some tea. Countenance more cheerful. Pulse sharp and small, 130 ; surface warm. All stimuli were now interdicted.

23d. More cheerful and composed ; passed a good night with several hours' sleep. The proper colour of the lips returning. Respiration regular and steady. Pulse 120, soft and compressible. The abdominal parietes, the previous night so sunk that the ilia stood up as in cases of death after protracted sickness and excessive emaciation, had recovered their tone and natural rotundity. There had been some pain at the wound, but it had ceased. In the evening of this day the pulse had decreased to 112, was soft and equable. He had nothing to complain of, and appeared remarkably improved.

24th. He was perfectly comfortable. Pulse 100 ; no tenderness of abdomen. The wound was dressed, and found adherent throughout. The ligature at the groin was loose in the wound.

28th. The case went on with perfect satisfaction till this day, when, at noon, hemorrhage again appeared at the wound in the groin, and it is thought

many ounces of blood were lost. It flowed at first gently from the part, afterwards in a larger stream, but not in a jet. Pressure with the hand restrained it. Graduated compresses of lint were carefully applied, and a truss so adjusted as to bring the pad to make firm pressure directly upon them. The truss, from the tightness with which it was applied, produced pain, which, however, an anodyne relieved.

29th. He was quite comfortable, excepting some uneasiness caused by the truss and one of the pieces of tape connected with it.

30th. The truss was removed, and the wound had a very healthy appearance, devoid of slough, and granulating favourably; the matter was small in quantity, and of a good character. The truss was reapplied in the same manner as before. Pulsation of the internal pudic artery was now observed. Pulse 100.

From this time the case went on quite favourably, and on the 4th of September the stump was nearly healed. The wound was perfectly healthy, and considerably contracted—the discharge was moderate in quantity, and quite healthy. The ligature applied to the epigastric was found loose in the wound.

On the 29th day after its application the ligature came away from the external iliac. The convalescence of the patient was steady and permanent. The wound rapidly and securely cicatrised, and on the 25th of October, the 101st day after the superficial femoral was tied, I saw him sitting in an apartment below stairs, very much improved in health

and appearance, and recovering his flesh and strength fast.

OBSERVATIONS.

When we consider the anatomical peculiarities of the femoral artery in the upper part of its course, viz. the uncertainty of the origin of the profunda femoris, the epigastric, and circumflexa ilii, as well as the probability of the internal circumflex artery arising from this vessel instead of the profunda, we might, without a fear of contradiction, and without reference to the result of experience, declare the common femoral artery singularly ineligible for an operation of this description.

We are acquainted with six recorded instances in which the common femoral artery has been selected for the application of a ligature, and two not hitherto given to the public. The dangerous hemorrhage which led the talented Abernethy to the performance of an operation never before attempted, was produced by a ligature placed upon this vessel. Sir A. Cooper has twice tied this artery; in one instance with success, in the other, hemorrhage arose on the fourteenth day, and death was the consequence. Sir B. Brodie has also tied this artery, and the result was hemorrhage and death. Dr. Murray applied a ligature to it, and owing to a violent bleeding which placed his patient, when the ligature was about to separate, in the utmost danger, he very properly tied the external iliac *. Mr. Ivory tied this vessel, and

* See Guthrie on the Arteries, p. 100.

in consequence of subsequent bleeding was under the necessity of taking up the external iliac. These are the six cases already recorded. In five of them violent bleedings followed, and in two of them death was the consequence, and would, in all probability, have occurred in the remainder had not the external iliac been tied. The two other instances alluded to occurred to Mr. Hewson. One was attended with a favourable result, the other with such bleeding that nothing, probably, but the operation to which it led, could have prevented a fatal termination. So that of eight cases in which a ligature was applied to this artery, six were attended with consecutive hemorrhage, two with death, and two with a favourable separation of the ligature ; giving to this operation a highly dangerous character.

Contrast with this the result of tying the external iliac. Mr. Hodgson, when he published his work on the arteries, knew of twenty-two cases where the iliac was tied, and not in one of these was there any secondary hemorrhage. Since that period the operation has been performed a great number of times, and, as far as I can ascertain, with the same exemption from this alarming occurrence. I cannot, indeed, find a single case recorded of bleeding attending the separation of a ligature placed upon this artery ; so that it may be said, not merely, as Mr. Hodgson observes, that the external iliac may be tied with as much safety as any artery to which a ligature has been applied, but that, of all the large vessels of the human body, it is the one that may be tied with the

greatest security, as far as the effects of the operation are concerned, and with the best effects upon diseases to which it is applicable.

There is no case, except that of wound of the artery at the groin, in which tying the common femoral possesses any advantage over the ligature of the iliac; I am therefore justified in concluding that the common femoral artery ought never to be selected, in any case of disease, for the application of the ligature, and that the operation should be exploded. It must, however, be added, that no preference is here claimed for the external iliac over the superficial femoral artery for the operation, in cases of popliteal aneurism, as some surgeons have suggested*, for we are decidedly of opinion that the operation of the illustrious Hunter, with Scarpa's modification, is in the first instance to be preferred. The volume of blood that must re-enter the main trunk by regurgitation through the profunda, if the ligature were placed in the first instance any where above its origin, will ever form, in my opinion, an insuperable objection, in the minds of all judicious surgeons, to the adoption of this method.

* See Harrison, Vol. II. p. 126.