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ST. GEORGE'S HOSPITAL.

ANEURISM TREATED BY PRESSURE, ILLUSTRATED BY A SERIES OF CASES.

By T. HOLMES, Esq., Surgical Registrar to the Hospital.

[Continued from page 419.]

CASE II. *Popliteal Aneurism: Pressure: Recovery.* A woman in good general health, 30 years of age, and unmarried, was admitted January 19th, 1852, under the care of Mr. Hewett, on account of popliteal aneurism on the right side. It seemed from her history that she had been conscious of pain down the calf of that leg, and of some difficulty in walking, for seven months; but that it was not till nine days before her admission (January 10th) that she had noticed a pulsating tumour in this ham. She had been working hard, but was not aware of any particular cause for the appearance of the aneurism. At the time of her admission, the latter was about the size of a large walnut, having a very distinct heaving pulsation, accompanied by a loud bellows sound. The swelling was considerably diminished, if it did not entirely disappear, on the application of pressure to the artery above, but filled again immediately on its withdrawal. Pressure was applied to the femoral artery above by means of a *presse-artère*, so as to diminish the force of the pulse in it about one-half. She was also ordered to be kept on low diet; but as she found means to supply herself with other food, this point is not dwelt on.

For the first few days the pressure seems to have been applied pretty steadily, and considerable progress was made, the tumour being not nearly so flaccid when the stream of blood in the artery was cut off. After this, however, she became restless, complained of pain and uneasiness down the leg and foot, and would not bear the pressure steadily. The instruments also appeared not sufficiently steady, and irritated the skin. A month after her admission (February 18th), they were removed, and fresh ones ordered from Dublin, slight pressure being in the meanwhile made on the sac of the aneurism itself. A good deal of consolidation had by this time taken place in the sac. The fresh instruments were of excellent construction, and answered their purpose admirably; but the patient's restlessness and the neglect of her attendants prevented her from deriving much benefit from the treatment, as it was found that the pressure was continually omitted for days together, and she was discovered once or twice walking about the ward. She would not submit, however, to any surgical operation. Matters went on in this unsatisfactory manner for some three months, till, in the latter part of June, fresh attendants came into the ward, and she was subjected to a more careful discipline. Pressure was now kept up in an efficient manner for a few days; and on the last day of the month, without any very marked previous diminution, the pulsation suddenly ceased. The tumour after this diminished to the size of a large nut, and became perfectly solid and hard. The knee was much contracted, and remained so for some time, but gradually recovered it-

self. In the following year she was employed for some months as an assistant nurse in the hospital. She was perfectly able to move about, but complained of much fatigue in the knee, from carrying weights upstairs.

CASE III. *Double Popliteal Aneurism; that on the Right Side treated by Pressure: Partial Cure: Suppuration into the Knee-Joint: that on the Left treated simultaneously by Pressure, unsuccessfully: Bursting of the Aneurism into the Cellular Tissue of the Leg: Ligature of the Femoral, followed by Gangrene of the Foot: Amputation of the Thigh: Pyæmia: Death.* R. B., a male, aged 27 years, was admitted, under the care of Mr. Tatum, on March 8th, 1854. He was a bargeman, accustomed to hard work and hard drinking, but had never before had any serious illness. He had been complaining of pain in the right ham, and stiffness in the calf of that leg, for about eight months, and had noticed a lump there for four months. He had, however, gone about his work till three days before his admission, when he left off, on account of the pain in walking. He had noticed a swelling in the left ham for a few days only. He paid little attention to them, and had not applied for medical advice till his admission.

On examining the right ham, a large, ill defined, pulsating swelling was found, which extended to both hamstrings on either side, and was in no perceptible degree moveable. The pulsation was generally of a heaving character, but towards the outer and back part a peculiar thrill was observed; and here, on admitting the blood to the tumour after pressure had been applied, the pulsation was felt running, like a wave, under the hand. The sound also, as heard through a stethoscope, varied, being of a soft blowing character at the inner part, and a much louder, more prolonged, sawing noise, at the outer, where the thrill was observed. On the left side was another popliteal aneurism, not larger than a small walnut, soft, with distinct heaving pulsation, depending on that in the main artery, pressure on which almost, if not entirely, emptied the sac. It communicated to the ear a soft, but but very distinct, blowing murmur. No other irregularity was noticed about the heart and arteries, except that the pulsation of the right axillary artery was thought more distinct than the left. The pulse at the wrist was natural, about 80.

He was put on low diet and kept quiet for five days after admission. During that time no obvious change occurred in the larger aneurism, but that on the left side had increased to nearly twice its former size. There was still no sign of solid deposit in the sac.

The treatment of the case was now commenced (March 12th) by the application of a heavy weight to the right femoral artery in the groin. This he applied himself every hour for as long as he could bear it; and, being very anxious for the cure of his disease, he applied this pressure more continuously than was prudent, so as to produce tenderness of the skin in this region. The tongue also became foul, and the pulse sharp. He was accordingly directed to continue the pressure more mildly, and during the two following days the weight was applied for from six to eight hours daily. This seemed to produce considerable consolidation in the sac; and though the pulsation and murmur remained of the same character, they were far less strong. At the same time, the aneurism in the left ham was growing rapidly, and had acquired the size of a common apple. There seemed to be still little or no solid in its cavity. He had passed a good night, and looked quite comfortable. Next day (15th), a good deal of effusion was

noticed in the synovial membrane of the right knee. The other symptoms remained much as before. It was now found necessary to allow him good diet and porter, and an opiate at night. Next day (the fourth of the treatment) the weight was replaced by a *presse-artère*, with direct pulsation by a pad in the ham. Under these measures, the pressure continued to diminish gradually in this aneurism, while the other went on enlarging, and became very painful. On the tenth day, accordingly (22nd March), it was found necessary to commence the treatment of this latter by applying a weight to the left femoral, which he did assiduously. The aneurism on the right side appeared to be progressing very satisfactorily. Pulsation could now hardly be distinguished when the pressure was removed, but the tumour still increased in size when the artery was let go after compression. He continued the direct pressure on this (the right) aneurism; and, after three days trial of the weight to the left artery, as it was found to occasion considerable pain, it was removed, and a *presse-artère* applied to this side also; but it was found very difficult to keep both instruments in their places, and the cure of the left aneurism made little progress. The swelling of the right synovial membrane continued, and on the 30th leeches were applied to this part, producing a temporary disappearance of the fluid, which, however, recurred, and continued afterwards persistent. Pressure by means of the *presse-artère* was applied to this artery till the 1st of April, when it was removed, as pulsation was no longer perceptible in the aneurism, and the size was unaffected by pressure on the artery. The weight was applied, as constantly as he could bear it, to the opposite artery, with the effect, as it seemed, of inducing some coagulation in the sac; and the pulsation, though still distinct, became weaker. Considerable oedema of the calf, however, came on; and, on the 10th inst., pulsation was felt in this oedematous swelling.

On the 11th of April, the pulsation was more distinct; there was great oedema of the limb. No bruit could be heard either in the aneurism or in the pulsating swelling of the calf. The swelling in the situation of the aneurismal tumour was much less distinct than before. All these signs concurring left no doubt that the aneurism had given way into the calf of the leg, and it was therefore decided to tie the artery without delay. This was accordingly done in the usual place (lower part of Scarpa's triangle) next day. The pulsation in the calf stopped immediately, and did not recur. The expression of the countenance, which had been noticed as anxious before the operation, improved. The pulse, which had been very weak and irritable, gained power. The limb continued quite warm, and he seemed going on well.

On the third day, however, after the operation, it was noticed that the swelling on the right side had increased in size, though no pulsation could be detected in it. Pressure was applied to the artery, but it produced so much irritation, that it was obliged to be suspended, and the disease was allowed to proceed, as no measure could be taken with it at that moment. It was hoped that should the operation on the opposite side succeed, it might yet be possible to interfere actively for the cure of the aneurism in the right ham; but on the sixth day after the ligature the signs of commencing gangrene appeared in that extremity. Vesications, full of bloody serum, showed themselves on the outer side of the leg and ankle, and the outer toes became dark and cold. He was much weakened and dejected. On the right side the swelling was obviously increasing, and could be seen to fill after the removal of pressure applied for some time on the artery. On the following day the gangrene was more decided, and was extending rapidly. The whole leg was very oedematous, so that the tibial arteries could not be felt. There was no pulsation in the calf. Under these circumstances it was thought necessary to amputate the thigh; and this was accordingly done on the 19th of April, a short distance below the point where the artery had been tied. (The account of the aneurism is given with the other appearances on dissection.) He went

on without any fresh symptoms for two days, but was very weak and pale, with rapid pulse, foul tongue, and dejected manner. On the third day, cough, with expectoration of tenacious mucus, came on. The swelling in the right ham looked larger, and the increase of size after the removal of pressure on the artery was more decided. On the seventh day after the amputation, symptoms of pyæmia (viz., profuse sweatings, change of colour, delirium, etc.) showed themselves. Next day, the swelling in the ham was measured, and found not to have increased for some days; but on the following (the ninth after the operation), as it had increased since the last measurement, and was looking red at one point, an exploratory puncture was made there. This was towards the inner side of the swelling. Nothing but serum and blood was evacuated. On the 1st of May, fluctuation was discovered in the knee-joint, and a puncture made at the inner side of the patella gave exit to bloody serum, followed by worm-like pieces of soft clot. A pad was put on this puncture; but as the swelling went on increasing, it was removed, and a copious discharge of thin serum was thus liberated. On the fifth, a slough formed on the outer side of the knee, and separated next day, giving rise to a copious discharge of thin, dark blood, apparently from the neighbourhood of the clot.

I do not dwell on the general symptoms, which were those of ordinary purulent infection, of which he died on the day following the last note (May 7th).

It will be noticed that no pulsation had been observed in the swelling of the right ham for more than a month, but that that swelling appeared still to have communication with the artery, inasmuch as it is noted that it varied in size with the application of pressure to the vessel as late as a fortnight before his death, after which time no observation on this point was made; but as no treatment likely to effect a closure of such communication had been adopted, there is every reason to suppose that it still continued.

On examining the amputated limb, the aneurism was found to be of large size, and its sac filled with layers of not very firm coagulum. The tumour was situated between the artery and the knee-joint, the posterior ligament of which had been extensively ulcerated, so as to expose the cavity of the joint freely. Its walls were also deficient behind, forming a free communication with the calf of the leg. The pressure of the aneurism had also caused erosion of the femur to a considerable extent where that bone enters into the popliteal space. The opening of the sac appeared of considerable size.

On the other side, the knee-joint was found exposed by the puncture made during life, and full of semi-purulent serum, mixed with loose blood-clot. Here, also, the posterior ligament was very extensively ulcerated, so that the joint and popliteal space were laid into one cavity. The vessels and surrounding parts were removed from the body, but were not examined for some time after death, during which interval the part was preserved in spirit. No traces of the aneurismal sac could be then discovered, nor of the large collection of blood which had been present in the popliteal space. The artery presented an opening towards the middle of the ham, on its anterior side, of small size (not so large as a fourpenny-piece), with thinned edges, the two internal tissues of the artery being there deficient, and its cavity from below this opening downwards, to the point at which it had been cut (about four inches), was occupied by blood-clot. This clot, however, did not entirely fill the vessel, leaving room for the passage of a common probe. It appeared to be of tolerably firm consistence, and was adherent to the inner coat of the artery. The coats both of the artery and vein appeared healthy, and the vessels in all the rest of their extent were quite pervious.

The body showed traces of pyæmia, depending on the amputation. The femoral vein of the amputated extremity was filled with pus and blood, and there were secondary deposits in the lungs and other parts.