SUBSTANCE OF A CLINICAL LECTURE

ON A

CASE OF FEMORO-POPLITEAL ANEURISM,

WHICH HAD BEEN LAID OPEN BY MISTAKE, AND
IN WHICH THE OLD OPERATION (THAT OF
ANTYLLUS) WAS PERFORMED.

Delivered at St. George's Hospital.

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You lately had the opportunity of seeing a case which is so rare in its occurrence, and which conveyed so many important surgical lessons, that I must recall your attention to it.

The notes of the case may be thus summarised. The patient was a young man aged 29, a labourer, in fairly good health. He had had syphilis about six years ago, but no secondary symptoms. His habits were, as far as is known, moderately temperate. A year ago, he fell from a wall about eight feet, and soon afterwards noticed a tumour in the calf of the right leg. No pulsation was ever noticed in this swelling. He was treated as an out-patient at St. Mary's Hospital for three weeks, after which he says that the swelling had quite gone. Five or six weeks ago, after a good deal of walking, he was loading a cart with coals, when he suddenly felt a sharp shooting pain down the right thigh, with a sensation as if something had given way about its middle; and half an hour afterwards, he noticed in this situation a swelling as large as a hen's egg. He went to bed, and remained in bed for a fortnight, after which he went to a neighbouring infirmary. During this time, the tumour steadily increased in size, but did not pulsate as far as he noticed. On his admission into the infirmary, careful examination was made in order to detect pulsation or *bruit*, but neither could be found. The tumour was twice explored with a grooved needle, and only dark-coloured blood was evacuated. On the day of his admission into this Hospital (March 6th, 1879), the tumour was punctured with a knife by the assistant of the surgeon to the infirmary. A jet of arterial blood issued from the puncture. The assistant plugged the wound with his finger, and sent for the surgeon, who enlarged the incision to the extent of about two inches. This was followed by a very formidable gush of blood. The wound was plugged with lint steeped in perchloride of iron, a tourniquet was applied, and the man sent to the hospital. When he arrived, the limb was much swollen, cold, and blue, and the patient much exhausted by hæmorrhage.

With this history before me, my impression was that the tumour would probably be found to be of a cancerous nature, with a large blood-cyst. It was clearly either this or an aneurism. In any case, the first thing to be done was to freely lay open the cavity. Accordingly, Esmarch's bandage was applied, and an incision about eight inches long was made, when the cavity was seen to be filled with the laminated clots externally and soft clots in the centre, which are characteristic of aneurism; and when all these had been removed, it was seen that there was no solid tumour, nor was it very clear whether the membrane which lined the cavity was a perfect sac or not. I determined to tie the vessel in the sac, and attempt to save the limb. It was by no means easy to find the opening of the artery; but at length what appeared to be the lower part of the sac was reached, situated quite in the popliteal space, and on tracing this round to its cæcal extremity, it was found to overlap a somewhat indistinct orifice about the size of a No. 10 catheter; and through this opening a probe passed for an unlimited extent downwards. This was accordingly taken to be the lower or distal opening of the vessel, and a silk ligature was tied round it. No proximal opening could be found, however, in this situation; but on trying to trace the continuity of the vessel upwards, the great sciatic nerve was seen exposed for about three inches. Afterwards, the artery was looked for at the upper part of the tumour, and here an opening was found, from which the probe passed easily in both directions—upwards and downwards—and it was quite easy to dissect the vessel out from the neighbouring tissues. A ligature was passed round the artery both above

and below the orifice, and then the bandage was taken off. No bleeding followed, except from a few insignificant vessels in the sac. These were tied, and the cavity was filled with carbolised lint, the wound being left open. When the bandage was removed, warmth began to return to the limb, which was then enveloped in cotton-wool, and the patient put to bed. The operation was a protracted one, lasting about an hour. His circulation was occasionally so low that it was necessary to suspend the anæsthetic.

I have been thus particular in describing the operation, because it is one rarely seen; but I need not detain you very long with the future progress of the case, especially as you have access to the copious notes and accurate drawings which my clinical clerk, Mr. Dale, made of it. The warmth and sensation of the foot at first seemed to return, but soon the whole dorsum of the foot began to slough, and the walls of the large incision also sloughed to a very great extent. When this latter slough cleared away, all the ligatures dropped off except the one tied on the proximal end of the artery, and the pulsation in the vessel could be seen down to this ligature on the eighth day after the operation. This ligature held on till the eighteenth day, when it came away without any hæmorrhage. Meanwhile, the sloughing on the leg and foot extended and deepened; but the man remained free from any alarming general symptoms, and his complexion gradually regained a more natural hue. Amputation was delayed till April 3rd, at which time all the soft parts on the dorsum of the foot had come away, exposing the tarsal bones, the joints between which were widely open, but the skin remained on the end of the toes. The gangrene of the skin had not spread beyond the level of the middle of the leg, so that it was hoped that a stump could be formed below the knee; but on cutting into the parts there to form the anterior flap, the muscles were found so rotten and so infiltrated with foul matter, that this idea was given up, and I amputated through the knee-joint, leaving the patella, as I believed that the parts forming the stump (which appeared perfectly healthy) would derive sufficient nourishment from the branches of the superficial femoral and profunda arteries; but in this I was disappointed. All the parts forming the anterior flap sloughed *en masse*; the end of the femur was freely exposed, with its cartilages; and so the unfortunate patient was condemned to a third operation. After the amputation, he suffered for a time from considerable shock; but this gradually subsided, and he seemed doing well; when, on May 15th, he was seized with a sharp attack of hæmaturia, for which there was no apparent cause. No anti-septic dressings were used during the whole case, and only occasionally a little weak carbolie lotion to syringe the sloughy cavity. The hæmaturia, however, passed off as it had come, though occasional sickness seemed for some days to testify to some kidney-irritation. At length, on June 6th, he seemed well enough to bear the removal of the exposed bone. Accordingly, I removed the patella and about four inches of the lower part of the femur, by simply pushing them through the remains of the great incision at the inner part of the thigh. The parts consolidated slowly round the end of the femur; and he left the hospital on July 16th. He was seen again on August 9th, with the stump nearly healed.

Besides several minor points of interest, this case presents these two questions of primary importance: first, How far was the original error of diagnosis avoidable, or, in other words, how far was the treatment pursued prior to the man's admission censurable? and second, Was the course which I followed the right one?

As to the first point, the history is no doubt a remarkable one. In the seventh volume of the *St. George's Hospital Reports*, I wrote a paper on the Diagnosis of Aneurism, in which I collected and commented on most of the recorded cases of failure of diagnosis, in which I showed that almost all of them proceeded from negligence in examination, for that there was clear evidence that in the great majority the tumour had never been auscultated. At the same time, I adduced proof—and amongst others a striking case under my own care—to show that there have been cases of aneurism in which the most careful palpation and auscultation have revealed neither pulsation nor *bruit*. The practical caution which I deduced from these histories is the following. "Fluctuating tumours in the neighbourhood of large arteries should never be opened (unless they are visibly and unmistakably abscesses) without a previous careful examination of their history, their pulsation, their *bruit*, the effect on them of compression of the main trunk if possible; and finally, in case the doubt remains, an exploratory puncture. If this very common-sense precaution were observed, we should hear less of mistaken diagnosis in aneurism." You will possibly say that this is no novelty. I can only reply that the observance of this precaution would have saved many a life and many a surgical reputation. But in the case before us, all this had been done, except perhaps the experiment on the effect of pressure on the femoral above the tumour, which, however, ought never to be omitted in a doubtful case. The paper in question

contains distinct proof of its high diagnostic value.* With this reservation, I do not see what more could have been done to establish the diagnosis. As to the treatment pursued at the infirmary, it might be perfectly correct up to a certain point. I am unable to estimate the indications for laying open the tumour, as I did not see the patient; but can easily understand that they might have been, and very probably were, quite sufficient. It was evidently increasing, and seems to have been producing considerable obstruction to the venous circulation. But I cannot help thinking—and this I wish strongly to impress on you as a practical caution—that when it was judged necessary to make an incision into a tumour of doubtful nature situated on the course of the main artery, and which had been previously twice explored with the result of showing that it contained blood, and, as far as we know, blood only, no incision should have been made without ample preparation for the ulterior proceedings, which are so likely to prove necessary; *i.e.*, amputation or the ligature of the artery. You saw the dangerous condition to which this man had been reduced, even after the short journey to this hospital, and you could easily imagine what would have been the consequence of a similar accident in a remote part of the country.

Next, as to the treatment which I pursued. To a certain extent, it was successful, as the man escaped with his life. But it is clear that if the thigh had been amputated at once, he would have been exposed to far less danger, and would in all probability have recovered some months sooner. Yet I am not on that account inclined to admit that I was wrong in performing the old operation, and so giving the patient a chance of preserving his leg. True it is, that the previous loss of blood and the oedema and coldness of the limb resulting from the prolonged compression rendered success improbable; but I think the attempt was a justifiable one. I am, however, free to admit that, when I was forced to amputate, it would have been better to do so at the level of the upper ligature on the femoral artery. This would have saved the man some weeks of suffering, and given him probably a better stump.

I was hardly prepared for the difficulty which I experienced in finding the orifice of the artery in the sac. Even now, I must confess that I could not describe the state of parts with any confidence in the accuracy of my description, nor explain by what I found at the operation the singularities of the previous history of the case. That the upper ligatures were tied on the femoral artery was plain, both from the fact that it was really dissected out of the tissue of the sac at the time of the operation with something approaching distinctness, and also from the fact that after the separation of the sloughy walls of the cavity, the artery could be seen pulsating down to the ligature in this situation. But I confess to entertaining very great doubt whether the ligature which was first tied was really placed on the artery at all. I regard it as more probable that there was a rent in the sac through which the probe passed, and that what I tied around the probe was really a portion of the sac itself. If you consult the history of a case in which Mr. Syme laid open an aneurism in the iliac fossa, and believed himself to have tied the common, external, and internal iliac arteries (*Med.-Chir. Trans.*, vol. xlv), you will find that only the external iliac was really tied, one of the ligatures having probably been placed on a portion of the sac, and the other two on the external iliac above and below the opening. Nor is such an error at all surprising. It is not always an easy matter, even on the dead subject, to dissect out the artery from the interior of the aneurismal sac; and on the living, besides the necessity of some reasonable speed, even when the circulation is completely commanded, there are many sources of fallacy from which the dissection of the parts after removal from the body is free. As far as I could judge,

however, I should conjecture that the femoral artery had given way, either completely or nearly so, somewhere near the opening in the adductor magnus, and the blood had poured into the cellular tissue of the limb (both in the thigh and popliteal space), making for itself an imperfect sac. At the upper part, this sac seemed more firm and membranous; at the lower, it was less distinct and very probably wholly deficient at the part where the sciatic nerve was seen. If we adopt this view, it would get rid of one of the most difficult questions in the case, *viz.*, why was there no pulsation? I have already, I think, insisted sufficiently (both in my paper above alluded to in the *St. George's Hospital Reports* and in other writings on Aneurism) on the indubitable fact that in almost all cases of mere rupture of an artery without the formation of a sac, pulsation is absent. *Bruit*, too, appears sometimes to be absent, or at least not to be heard; for it is possible that in some of these cases at least the *bruit* has been low and only audible over a limited part of the tumour, and so has been missed (see Pirogoff's cases quoted in my paper). The former appearance of a non-pulsating tumour in the same situation which disappeared without any further symptoms is strange, and I cannot offer any probable explanation of it, unless it may be that a small rent then formed in the artery which closed spontaneously.

The rupture of an artery at a comparatively early age and without proof of general disease of the arterial system is, I dare say, rare; but I do not think it is so rare as is often believed. I have seen several cases which hardly admitted of any other explanation, and there is a preparation in our museum which bears so great an analogy to what I believe occurred in our patient, that I have thought it right to bring it into the lecture-room.* It shows the common carotid artery, in which, just below the bifurcation, there is a small opening leading into an enormous sac in the cellular tissue. The patient's age was the same as that of the subject of the present lecture—twenty-nine. The rupture occurred from no known cause, as he was at his ordinary work—that of kneading bread. The first symptom of it was a diffused swelling, which gradually became circumscribed and pulsated with a whirring sound, then became again diffused, and lost its pulsation. No operation was undertaken, and the patient died of suffocation. The history is rather incomplete, as the case occurred thirty-five years ago, before the present system of recording the histories of all cases along with their *post mortem* examinations was commenced. In this preparation, there are one or two small patches of atheroma near the orifice of the sac, but the chief part of the artery is healthy. You will at once see in how many respects the history of this case resembles that of our present patient. An artery gives way without known cause; a diffused swelling is the result, which pulsates when the sac is entire, but loses pulsation when the sac bursts. In the case which furnished the preparation, the old operation would have been, to say the least, very difficult and might have proved impossible. But if it could have been completed without fatal hæmorrhage, it would doubtless have saved the patient's life.

The lessons which the present case teaches may be summed up as follows. 1. It affords another example of the occasional existence of aneurisms (so-called) which do not present the ordinary symptoms of pulsation and easily recognised *bruit*. On this subject I have said as much as I usefully can in the paper to which I have already referred you. 2. It shows the difficulties and ambiguities which surround the old operation when performed in such cases. The cases usually present a large ill-defined and probably imperfect sac and a relatively very small arterial opening. 3. It shows the danger of meddling with tumours of this sort, unless the surgeon is prepared with all the appliances and assistance which he will require in order to undertake the formidable operation which may become necessary. 4. It shows how probable gangrene is in such cases, in spite of the evacuation of the contents of the tumour, and although only a small part of the artery may have been included between the ligatures. 5. It is an interesting example of the fact, so often noticed in gangrene occurring after ligature of a main trunk, that the visible destruction of skin and superficial parts does not always give a just idea of the extent to which the deep parts may be implicated, if not in absolute gangrene, at least in a low unhealthy degeneration; and therefore how much better it is in such cases to amputate through or near the level of the highest ligature.

* Series vi, No. 112, in the hospital museum.

UNLICENSED LUNATIC ASYLUM.—At the Brackley Petty Sessions, Mrs. Rhoda Bishop of Culworth House, the widow of a surgeon, was charged with receiving into her house two lunatics, such house not being a house or asylum registered under the Lunacy Regulations Act. Mr. Harris, barrister, instructed by the solicitors for the Lunacy Commissioners, prosecuted, and Mr. Underhill, barrister, of Birmingham, appeared for the defence. After hearing the evidence of Mr. Jacobs, a surgeon, and other witnesses, the Bench committed the defendant for trial at the Northampton Assizes. She was liberated on bail.

* The passage to which I chiefly referred is the following (*St. George's Hospital Reports*, vol. vii, page 181). The case is reported in Pirogoff's *Klinische Chirurgie*. "A man who had before suffered from a phlegmonous abscess in the thigh, and who was rheumatic, presented himself with a large inflamed swelling, indistinctly fluctuating, below the pectoral muscles and in the axilla. Not doubting that it was an abscess, Pirogoff had the scalpel in his hand to open it, when it occurred to him to auscultate the swelling. A low *bruit* revealed the true nature of the case. The symptoms are not very fully given; but the subclavian was ultimately tied. The patient died, and, on dissection, it was found that there was a small opening in the axillary artery, and the swelling consisted of blood extravasated under the pectoralis minor. From these cases, Pirogoff deduces the practical rule, never to open a deep-seated swelling, however plainly it may fluctuate, without previous auscultation, though he points out that *bruit* may exist in swellings which are not aneurismal (such as medullary cancer), and that in swellings which are in all probability aneurismal, the *bruit* may only be audible in parts. He thus sums up the whole subject: 'If I were asked what signs I hold most decisive of the existence of an aneurism which does not pulsate, I must confess that, if there be no *bruit* to be heard at any part of the tumour, I know of no other than these two—(1) collapse of the swelling, sometimes only to a slight extent, when the main artery is compressed between the heart and the tumour; and (2) if the pulsation of the artery can be felt upon the surface of the tumour, an unnatural extension of its impulse; for example, over twice the usual breadth of the vessel. But, in order to satisfy oneself of these two phenomena, it is, of course, necessary to examine the case repeatedly, and with the greatest attention. The diagnosis must not be founded on a single examination.'" Reference may also be made to a paper on aneurisms which do not pulsate, by Mr. Marrant Baker in the new (15th) volume of *St. Bartholomew's Hospital Reports*.