A C A S E
OF
ANEURISM OF THE FEMORAL ARTERY,
THE
SAC OF WHICH BURST, AND ITS TREATMENT;
WITH OBSERVATIONS.

BY
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ON the 7th of April, 1867, a man, æt. 40, was admitted into Guy's Hospital under my care, on account of a large and very painful swelling, occupying the whole of the front of the right thigh. Pulsation, synchronous with the action of the heart, was distinctly felt in almost every part of it; as well as the peculiar increase of size at each contraction of the left ventricle which usually accompanies a tumour in immediate communication with the interior of a large arterial trunk.

The man himself gave an account of the progress of the disease, for he had never before this time sought surgical assistance. For about eight months he had felt a swelling in front of the right thigh, which beat "like your pulse, you know," these were his words. It increased slowly; had been almost painless, and had never obliged him to desist from his

usual labour. Whilst at work, during the forenoon of the day of his admission, he felt something snap in his thigh, at the site of the long noticed swelling, and almost immediately afterwards the limb became swollen and very painful.

He was unable to continue his occupation, and maintained a state of repose, but rubbed the swelled part with a liniment. The pain and swelling increased, and he entered Guy's Hospital about ten hours after the "bursting of the swelling," as he styled it.

I saw the man about 8 o'clock in the evening, a short time after admission. The integuments of the right thigh were tense, almost as if ready to burst; by firm pressure the tumour felt elastic, and pulsating movements of the contents were very distinct. There was not a trace of pulsation to be felt in the popliteal artery or its branches. The femoral pulsated strongly above the swelling. The foot and about half the leg were œdematous.

There was not the slightest difficulty in discriminating the character of the disease: it was too palpable to admit of doubt.

As regards treatment, three methods suggested themselves:

1. Amputation of the limb above the aneurismal sac.
2. Deligation of the external iliac artery.
3. To incise the sac of the aneurism and apply a ligature on the vessel entering it from above, and another on that leaving it below.

The last operation I performed as follows: I made an incision into the sac about six inches long, the one through the integuments being about ten inches. Its whole course was parallel with the fibres of the sartorius muscle. The contents of the sac escaped at once, so that the openings of the artery above and below it were immediately seen. The hæmorrhage, however, was completely arrested by Mr. Cooper Forster, who had charge of a tourniquet applied over the abdominal aorta, and by the pressure he made upon the external iliac artery. A flexible catheter was passed into the lower division of the femoral artery; a ligature was quickly

placed around it and tied after the catheter was withdrawn. Without disturbing the relations of the femoral artery above the sac more than was absolutely necessary, I passed a ligature beneath it with great facility, and tied it about half an inch above where the sac commenced.

The apertures of the arterial trunk were about three inches apart, and a layer of arterial tissue connected them and formed the posterior wall of the aneurismal sac. Upon this, and especially towards the upper orifice, there was earthy, atheromatous deposit.

Very little fibrine was seen in the sac.

Sutures were used to bring together the edges of the wound in the integuments at the upper and lower ends; the centre was allowed to gape, although the whole was supported by strips of moist bandage. The limb was enveloped in a flannel bandage, and a pillow was placed beneath the popliteal region, so that the member might repose in the most easy position.

During the following twelve hours the chloroform produced a nauseating effect, and he vomited slightly.

On the 8th there was no constitutional disturbance; there was a slight escape of serum from the wound, and the temperature of the foot and leg was normal.

9th, second day.—He slept well during the night, and his condition was undisturbed. The wound of the parts not infiltrated with blood was quite healthy, and beginning to heal. Removed two sutures, those nearest the centre of the wound, which allowed a more free escape of serum. Temperature of the limb normal.

10th, third day.—Very well. Feels hungry, and ate a small mutton cutlet. The ends of the wound healing. Removed the two remaining sutures. The centre of the wound, the site of the sac, and part of the sartorius muscle, which was infiltrated with blood, were sloughing. To discontinue the wet lint, and to use strips of bandage bathed in a solution of permanganate of potash, and to syringe the wound frequently with that solution. This local treatment was assiduously carried out by the dresser of the case, Mr. William Toulmin,

and the progress to convalescence was uninterrupted for several days. Generous diet and stimulants were liberally allowed.

16th.—On this day, the ninth from the operation, a large slough came away. The wound was healing rapidly, and the man's general health scarcely affected.

17th.—This being the tenth day, the lower ligature came away, and from this date there was nothing deserving of remark until the

22nd—or the fifteenth day after the operation, when the upper ligature separated without bleeding even from the granulations by which it was surrounded. The surface of the whole wound was covered with the healthiest of granulations, from which there was very little suppuration, and the ends of the wound had cicatrized. The last day or two he had been somewhat troubled with a cough, and as he did not restrain the action of his abdominal muscles in that effort, but, on the contrary, used much force, I cautioned him, and directed that he should place digital pressure over the region of the femoral artery, below Poupart's ligament, when the fit of coughing was violent. This he did frequently, but on the

24th—about 4 a.m., whilst coughing, he felt blood trickling down his thigh from the upper end of the wound. This was the seventeenth day from the operation, and the second since the upper ligature came away.

The hæmorrhage was easily controlled by pressure, but before its application he had lost much blood. When I saw him, about ten hours afterwards, his face was blanched, his pulse weak, and he was very desponding. I told him I must again stop the bleeding by tying the artery, to which, after exhibiting slight reluctance, he consented. Chloroform was administered, and by merely breaking down the recent adhesions with the finger, the open mouth of the vessel from which the blood flowed was soon discovered. Pressure was, of course, made upon the external iliac artery. The trunk of the vessel was rather firmly united to the surrounding tissues, and its separation from them was effected with some difficulty. A ligature was passed around the vessel and tied.

This checked all bleeding, but the vessel did not pulsate at the site of the ligature, nor for half an inch above it, although above that point the beat of the artery was distinctly perceptible.

25th.—Passed a quiet night, although he was rather nauseated by the chloroform. He had quite recovered his usual spirits, and spoke hopefully of recovery.

30th.—Progressing favorably, although his appetite is indifferent. The stimulants have been continued. The wound is again closing up, and the suppuration moderate and healthy.

May 2nd.—Last evening there was a trifling escape of blood from the upper end of the wound, and the dresser found the ligature detached. This was the eighth day from its application. When I saw the man, at 2 p.m., there had been no more hæmorrhage; the wound was healing, and its appearance was quite healthy. The whole limb was bandaged, and a compress applied over the femoral artery.

5th.—Cicatrization advancing rapidly; appetite improved. To sit up in bed, supported by pillows. The bandage discontinued.

9th.—At 1.30 a.m. there was bleeding to about two ounces from the upper end of the wound, which ceased before the house-surgeon reached him. A graduated compress was, however, applied over the artery as before.

13th.—There has been no bleeding for four days; he eats well, taking meat. The wound is nearly healed.

During the subsequent weeks of May he was troubled with rheumatic pains in the arms and trunk; the wound, however, healed favorably, and in the last week he was able to leave the bed and walk about the ward. In fact, the wound was healed in eight weeks.

He was discharged from the hospital on the 3rd of June, fifty-seven days after admission.

Remarks.—This patient had pursued the occupation of a sand-dredger on the Thames for a period of twenty years. It is one attended with unusual exposure to the vicissitudes of

weather, and requires great bodily exertion. He had always lived very freely, partaking daily of abundance of animal food, as well as stimulants. The general nutrition of the man was very good.

Treatment.—At the commencement of the narration of the case I briefly alluded to three plans of treatment.

1. Amputation of the limb. This operation I considered to be pregnant with risk, and almost certain to be followed by a fatal termination, for the following reasons. The incisions must have been made close to the hip-joint, and surgeons generally admit that primary amputations near to the pelvis are rarely attended with success. Besides, it seemed to be the duty of the surgeon to take other measures, and to attempt to save the limb before resorting to that expedient; in fact, to keep that procedure in reserve.

2. Deligation of the external iliac artery could have been easily performed. It would have been a comparatively bloodless operation. But the following objections I regarded to be paramount. I might have arrested a large supply of blood to the limb, and, on the other hand, the flow of blood to the aneurismal sac might not have been impeded. For, as the disease had existed some months, it was reasonable to assume that the collateral branches about the pelvis were probably dilated, and by these channels the stream of blood would be conveyed to the member. From the great local tension there was reason to fear extensive sloughing in the neighbourhood of the aneurism, as well as of the tissues below it, which were even already congested and œdematous, thus affording sufficient evidence of venous compression.

Therefore, acting on the principle that the aim of the surgeon should be the eradication of the local disease, I decided to perform the operation above described.

3. In thus having recourse to the oldest method adopted for the treatment of aneurism, I was not unmindful of the difficulties I might have to encounter, and which are so fully described in all monographs upon this subject. But since the introduction of chloroform the mental calm and repose

which the surgeon experiences when he knows that the patient is not suffering at his hands, enables him to meet and overcome difficulties which were appalling to our predecessors, and to adopt measures, especially in a case of this kind, almost impracticable before. I allude to pressure with a tourniquet on the abdominal aorta. By this instrument hæmorrhage was entirely arrested.

The operation itself was completed with the utmost facility. As soon as the blood and coagula were removed, the open mouths of the femoral artery at the upper and lower end of the sac were immediately seen. I preferred the introduction of the flexible catheter within the artery in place of a probe, because it slightly dilates the vessel, and at the same time fixes it. When thus the artery is rendered steady by an assistant holding the catheter, the ligature is guided round the vessel with great ease. If an ordinary probe be used, the artery rolls about upon it, and it is not so easily separated from the surrounding connective tissue.

In the treatment of the secondary hæmorrhage, which happened two days after the separation of the upper ligature, I acted upon the principle propounded by Mr. Guthrie, namely, that of securing the bleeding vessel from the original wound, instead of tying the trunk at a distance and inflicting a second one. In doing this no real difficulty was found.

4. Immediately after the operation, when the man had sufficiently recovered from the nauseating effects of the chloroform, he was allowed to select his diet, and to take as much food of a nourishing kind as he wished. Stimulants were allowed liberally, and a favorite beverage seems to have been rum diluted with milk. Rum he preferred to brandy, therefore he had it. As soon as he wished for porter it was given him, and he consumed about two pints per diem on the average. At one time his appetite for animal food failed entirely. He then made choice of stewed eels, which was the only food he had for a few days.

Ferruginous tonics were administered very soon after the operation.

Table showing the results of the Inoculation of Guinea-pigs with Expecto- rations, &c., from Tubercular Phthisis, with weights of Animals after Inoculation.

WEIGHTS IN GRAMMES.

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No.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.
Material inoculated.	Phthisis expecto- rations. Second stage. Received Nov. 15, 1866.	Phthisis expecto- rations. C. W.— Received Nov. 22, 1866. Second stage.	Phthisis expecto- rations. W. C.— Expecto- rated Dec. 2 to 3. Second stage.	The same expecto- ration as No. III.	Phthisis expecto- rations. S— chronic second stage advanced. Expecto- rated Jan. 11 to 12.	Phthisis expecto- rations. Jane N—, chronic third stage. Ex- pected Feb. 15.	Phthisis expecto- rations. John S—, advanced second stage. Expecto- rated Feb. 15.	Phthisis expecto- rations. M. C—, commencing chronic second stage. Expecto- rated Jan. 15.	Phthisis expecto- rations. M. C—, Second stage ad- vanced. Expecto- rated Feb. 15.	Phthisis expecto- rations. Bessie S—, Chronic second stage ad- vanced. Expecto- rated Jan. 15.	Phthisis expecto- rations. H. P—, Second stage. Expecto- rated March 5.	Doubtful phthisis expecto- rations. Annis D—.	Bronchitis expec- to- rations. John K—.	Doubtful phthisis expecto- rations. Lydia R—.	Blood taken from body of phthisis patient after death.	Blood taken from No. XV on the 11th day.	Empyema. Pus from thorax. Doubtful phthisis.	The same pus as No. XVII.	Healthy animal of the same litter as Nos. VIII and X, weighed at the same time for comparison.
Date of inoculation.	Nov. 19, 1866.	Nov. 22, 1866.	Dec. 4, 1866.	Dec. 5, 1866.	Jan. 12, 1867.	Feb. 16, 1867.	Feb. 16, 1867.	Jan. 17, 1867.	Feb. 16, 1867.	Jan. 17, 1867.	March 7, 1867.	March 5, 1867.	Jan. 17, 1867.	March 5, 1867.	Jan. 15, 1867.	Jan. 26, 1867.	March 4, 1867.	March 4, 1867.	
Weight before inoculation		668.03	.....	462.19	244.82	457.8	451.2	103.25	629.45	95.17	533.2	592.55	396.09	718.2	318.20	447.4	517.9	592.6	.....
1st day after			396.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2nd " "			391.8	.....	.....	.....	.....	.....	.....	.....	549.5	.....	.....	.....	.....	.....	.....	.....	.....
3rd " "			Died Dec. 6	465.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	487.4	.....	.....	.....
4th " "												649.75	.....	751.6	.....	.....	.....	.....	.....
5th " "		713.0	.....	.....	.....	485.87	463.68	112.82	668.95	104.27	603.3	Died March 9	448.45	.....	.....	.....	525.88	548.65	.....
6th " "																525.65	.....	.....	.....
7th " "								127.01	.....	123.2	.....	.....	430.15	727.3	313.35	.....	.....	.....	.....
8th " "	416.52	.....	.....	.....	.....	473.9	459.5	135.25	657.0	127.5	.....	.....	424.9	.....	298.7	.....	501.90	548.4	158.85
9th " "		722.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Died March 13	.....	167.85
10th " "					293.45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	452.1	576.4	.....
11th " "											556.35	.....	.....	.....	290.55	.....	.....	.....	181.6
12th " "	446.62	.....	.....	.....	295.15	495.35	472.65	.....	688.95	.....	.....	.....	468.2	.....	.....	545.7	.....	.....	.....
13th " "														777.8	.....	.....	.....	.....	.....
14th " "								149.1	.....	141.6	516.8	.....	.....	.....	312.7	.....	.....	540.8	177.6
15th " "					293.3								480.22						
16th " "		735.24				483.05	469.33	150.0	636.1	141.25									
17th " "																			
18th " "											512.6								
19th " "	449.4																		
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44th " "				Died Jan. 17, 1867															
45th " "				282.39															
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51st " "		Died Jan. 11, 1867																	
52nd " "		461.63																	
53rd " "	Died Jan. 11, 1867																		
54th " "	257.56																		
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Results—	Tubercles in liver and spleen.	Tubercles in both lungs, found, and liver.	No tubercles found.	Tubercles in liver.	Abscess at point of inoculation. Tubercles in lungs, liver, pancreas, mesenteric glands, and spleen.	Ulceration at point of inoculation. Tubercles in liver and spleen.	Tubercles in liver and spleen.	Tubercles in lungs, liver, and spleen.	Tubercles in liver, spleen, and mesenteric glands.	Tubercles in spleen.	Tubercles in spleen.	No tubercles found.	No tubercles found.	No tubercles found.	Ulcerations at point of inoculation. Tubercles in liver, spleen, and lymphatic glands.	No tubercles found.	Tubercles in liver, spleen, and mesenteric glands.	Tubercles in lungs, liver, spleen, mesenteric and lymphatic glands, and in diaphragm.	Still alive and healthy.