A CASE OF THORACIC ANEURISM

TREATED BY THE

INTRODUCTION OF STEEL WIRE INTO THE SAC.

BY

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THOS. B—, æt. 48, a publican, was admitted into the Middlesex Hospital, June 5th, 1885, under the care of Dr. Cayley.

Patient, who was formerly a sailor, had not had good health for some years. He had been subject to rheumatic gout, and what he described as liver complaint, and had probably been a pretty free drinker. In 1858 he had syphilis, and in 1860 an attack of fever at Calcutta.

In November, 1884, he began to suffer from symptoms of thoracic aneurism, and attended the Middlesex Hospital as an out-patient under Dr. Fowler, but it was not till five days before his admission that a visible tumour made its appearance at the root of the neck.

On admission, he was a well-nourished man of good muscular development and rather florid complexion. He complained of a constant aching pain over the upper part of the chest, which prevented sleep; he had a clanging

metallic cough with inspiratory stridor, and there was some difficulty in swallowing.

There was an oval elastic swelling about the size and shape of a hen's egg, situated above and behind the right sterno-clavicular articulation, which was bulged forwards; the tumour rose about three inches into the neck and encroached upon the sternal notch. It had a very distinct expansile pulsation, and on auscultation the heart-sounds were very plainly audible over it; but there was no bruit. There was dulness on percussion over the tumour and for some distance below it over the sternal region. The heart-sounds were normal, but the heart was a little displaced downwards and to the left. There was no difference in the radial pulse on the two sides; the pupils were equal and normal. The air entered both lungs equally; the breathing was attended by much tracheal stridor. Pulse 84, resp. 20, temp. 98·4°.

He was directed to keep constantly in the recumbent posture, and was ordered a diet consisting of milk six fluid ounces, beef tea six fluid ounces, meat five ounces, and bread five ounces, with two eggs, and he was given twenty grains of iodide of potassium three times daily; this was gradually increased to sixty grains three times daily. He was also given opium to procure sleep.

Under this plan of treatment the tumour rapidly increased, and it was evident that it must soon burst externally or become diffused among the tissues of the neck.

A consultation was held with my colleagues, and it was decided to treat the aneurism by introducing wire into it, as was practised by the late Mr. Charles Hewitt Moore in a case published in vol. xlvii of the Society's 'Transactions.'

I was induced to urge this course from having made the post-mortem examination of Mr. Moore's case, which satisfied me that the fatal termination was due entirely to pyæmia, the result probably of some septic poison having been introduced into the sac. So far as the aneurism was

concerned the operation had been successful, consolidation having been effected.

In the present case there was some doubt as to the point of origin of the aneurism, whether it might not spring from the innominate artery and so be amenable to distal ligature. Aneurisms of the innominate are, however, very rare as compared with those of the arch; in this case, too, the carotid artery seemed to come from behind the tumour; moreover, Dr. Fowler, who had treated the patient at the onset of the symptoms, then considered it to have been aortic.

My own opinion was that the introduction of wire into the sac was under any circumstances a less dangerous proceeding than distal ligature of the subclavian and carotid arteries.

Mr. Hulke having concurred with me that this operation would, under the circumstances, give the patient the best chance, it was accordingly determined on.

A long coil of fine steel wire, prepared by winding it in a very close spiral on a mandril, was cleaned by placing it for twelve hours in strong *Liquor Potassæ* in order to remove adherent grease and render it antiseptic.

I believe that steel wires are liable to have adherent to them grease which is used in tempering them, and this might readily be the means of introducing septic material, and to this, or to the trocar and cannula not having been thoroughly disinfected, I am disposed to attribute the occurrence of pyæmia in Mr. Moore's case.

The coil of wire thus cleansed was placed on a brass cylinder of a half an inch in diameter. The spirals were consequently very small, and though this rendered the introduction of the wire more troublesome, it had the advantage of causing it to coil up in the neighbourhood of the puncture instead of passing to a greater distance in indeterminate directions.

On June 28 the patient was anæsthetised and Mr. Hulke introduced a fine trocar and cannula, the lumen of which was just sufficient to easily transmit the wire, into

the aneurism an inch above and a little to the outer side of the right sterno-clavicular articulation, and after withdrawing the trocar passed forty feet of the wire through the cannula into the sac. Strict antiseptic precautions were observed, including the passage of the wire, as it was drawn off the cylinder, between two folds of sponge wet with a $2\frac{1}{2}$ per cent. solution of carbolic acid.

On withdrawing the trocar a little blood spurted from the cannula, and during the passage of the wire some oozed by its side. When the cannula was withdrawn a localised hæmatoma formed under the skin.

No constitutional disturbance followed the operation; the temperature remained normal and the pulse unaffected. The pain at the root of the neck, of which he had previously complained, much abated. The following day it was noticed that the pulsation of the tumour was much less marked.

The hæmatoma gradually absorbed, and the tumour became converted into a hard mass with a slight communicated pulsation. The clanging cough, laryngeal stridor, and occasional attacks of dysphagia continued.

On July 3rd an irritable pustular rash appeared on the thighs, due probably to the iodide of potassium; this was accordingly discontinued.

In August signs of extension of the aneurism to the left and backwards showed themselves.

August 9th.—It was noted that the tumour on the right side was quite hard and free from pulsation. To the left of the tumour in the sternal notch, and behind the left sterno-clavicular articulation there was distinct pulsation. There was dulness on percussion over the upper part of the sternum reaching an inch to the left of its left border. Over this region the sounds of the heart were abnormally distinct, but there was no bruit.

There was much stridor with the breathing, and frequent attacks of coughing accompanied by severe dyspnoea, during which the face became much congested. Some glairy mucus was expelled with great difficulty.

It was now evident that the aneurism would soon prove fatal from pressure on the trachea, and I thought it might be possible to cause consolidation of that part of the sac which was causing this pressure by a repetition of the operation.

Accordingly, on September 10th, the patient was anæsthetised, and Mr. Gould, in the absence of Mr. Hulke, who was away for the autumn vacation, introduced a trocar and cannula into the sac above and to the left of the left sterno-clavicular articulations, directing the instrument somewhat obliquely inwards towards the middle line, and passed in thirty-four feet nine inches of wire. At first the wire met with some resistance, but this soon ceased and it passed easily. At the end resistance was again felt and the wire was then cut short and the end pushed down the cannula into the sac by passing a blunt trocar. About a fluid drachm of dark blood escaped during the operation. Some hours after the operation the patient vomited after taking food. At 5 p.m., eight hours after the operation, the temperature was 99.4° ; at 10 p.m., 98.2° . He passed a pretty good night, but coughed several times and had difficulty in expectorating. During the next four days he continued much in the same state as before the operation, still having attacks of cough and dyspnoea; the temperature varied from 99.4° to 98.2° . He also continued to complain of a good deal of pain over the upper part of the chest, which was perhaps more severe than before the operation.

The pulsation over the upper part of the sternum and to the left of it did not appear to be much altered.

September 16th.—He complained of a good deal of pain about the region of the last puncture, passing through to the shoulder and down the left arm. The attacks of coughing and dyspnoea were more severe and frequent. Temperature continued to fluctuate between 99.4° and 98.6° . It was thought there was some increased pulsation over the aneurism. An ice-bag was applied and morphia administered subcutaneously.

The next day the pain was less, but the temperature

rose at night to 102·4. The attacks of cough and dyspnoea continued to recur.

September 18th.—The temperature had fallen to 98·2°.

September 19th.—Temperature at 10 a.m., 97·6°. In the evening he was seized with a severe attack of dyspnoea, during which his face became congested and cyanosed. He was given a hypodermic injection of morphia, but without relief. He became unconscious, with twitchings of the muscles of the face and limbs, and died in about two hours.

On post-mortem examination a large aneurism was found to spring from the ascending part of the arch of the aorta, which was generally dilated and atheromatous. The aneurism, which communicated with the artery by a very large opening, extended up behind the sternum into the neck, reaching on the right side to three inches above the sterno-clavicular articulation. The walls of this part of the tumour were only formed by a little condensed connective tissue about the sixth of an inch in thickness. The upper part of the sac was filled by a firm pinkish clot, embedded in which were the two coils of wire. Below this for some distance the cavity was occupied by softer blackish clot; then there was a layer of decolorised, fibrine which separated this part of the sac from the lowest part which was in immediate continuity with the dilated vessel. This lowest part of the sac contained no clot, and corresponding to it the trachea, a little above the bifurcation, was flattened by pressure and its mucous membrane much reddened and inflamed. The bronchial tubes and the lower part of the trachea contained much viscid mucus. The upper part of the sternum was eroded and its inner surface exposed in the aneurismal sac. The heart itself was normal. The branches of the arch were not implicated in the aneurism.

The other organs presented nothing abnormal. No embolisms were discovered.

In this case the first operation produced the desired effect of consolidating that part of the aneurism which

projected into the neck, the rupture of which was imminent. The second operation only completed the consolidation of the upper part of the sac, but had no effect on the lower part which was compressing the trachea. This part of the sac communicated with the aorta by so large an opening, and was in such immediate connection with the main blood-stream, that even if the wire could have been passed down so far it could hardly have failed to cause embolisms.

This case, with others that have been treated in a similar manner, shows, I think, conclusively that the method is free from any great amount of risk. But its value as a means of effecting a cure of those aneurisms which usually fall within the province of the physician, as being considered inaccessible to surgical treatment, has still to be estimated.

The following are all the cases of this mode of treatment which I have been able to discover :

(1) Mr. Moore's case, already referred to, where the patient died of acute endo-arteritis and endocarditis with pyæmia.

(2) Dr. Baccelli¹ treated two cases of thoracic aneurism by the introduction into the sac of fine spring-wire. Both cases terminated fatally, but in neither did any ill effects follow the operation; in one, death seems to have been caused by incautious pressure on the sac by the stethoscope in auscultation.

Dr. Baccelli attached great importance to the point whether the communication between the aorta and the sac be small or large, and he appears to have laid down rules for ascertaining this, but as only a brief abstract of his paper is published in the Bulletin these are not given. He considered that the operation was only likely to succeed where the communication was small.

(3). Professor Loreta, of Bologna, in 1885, introduced twenty-two yards of silvered copper wire into a large abdominal aneurism, first making an abdominal section; the aneurism consolidated and became reduced to the size

¹ 'Bulletin de l'Acad. de Méd.,' 1878, p. 18.

of a walnut, and the patient was discharged, apparently cured, on the seventieth day. On the ninety-second day he died suddenly from a rupture just at the junction of the sac and the aorta.¹

Besides these cases, distal aneurisms have been treated in a similar manner, but these are foreign to the subject of the present communication.

It thus appears that up to the present time no case of aortic aneurism has been cured by this operation, and I am disposed to agree with Dr. Baccelli that it is only where the communication between the aorta and the aneurism is small that this is to be expected. But I think that it affords us the means of consolidating any portion of the sac within reach, and thus we may safely and easily prevent external rupture where this is impending, and may perhaps in some cases relieve pressure on the trachea or other important structures.

¹ 'Memorie della Accad. delle Sci. dell Ist. di Bologna,' vol. vi, 1885.

(For a report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 59.)