Clinical Lecture

ON THE

PROGNOSIS AND TREATMENT OF THORACIC ANEURISM.

DELIVERED JANUARY 5TH, 1861, AT ST. MARY'S
HOSPITAL, LONDON.By T. K. CHAMBERS, M.D., Censor of the College
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I ADMITTED yesterday into Victoria Ward a prostitute, aged 22, who has been nearly a year in the Lock Hospital. She has had syphilis more or less since the age of 14; and though the secondary sores are now healed, her health is naturally much broken, and she looks anæmic and weakly. She comes into St. Mary's, not for this disease, but on account of palpitations and pain across the front of the chest, which, she states, she has experienced for three years, but which lately have got much worse. She has also frequent giddiness and fainting; and last Sunday was carried out of the Lock chapel in a dead swoon. The house-surgeon has just been in to report that on account of one of these attacks she is unable to come down to the theatre, as I had desired.

She has often a difficulty in swallowing food, especially solids.

She states that she has very partial use of the left arm; and, on examination, it is smaller in girth to a marked degree, and the muscles are flabbier than on the right side. No pulse can be felt at the left wrist, nor at the bend of the elbow, nor on the inner side of the biceps. The axillary artery can be felt beating very feebly in the supraclavicular region.

In a marked contrast to this stands the right side. The pulse at the wrist is natural, and above the collar-bone may be perceived a strong pulsation, and at the origin of and for an inch or more along the carotid a very distinct thrill. In the hollow above the sternum the same pulsation is even stronger, and throws forward the trachea, when you press upon it with your finger.

On applying the stethoscope, a purring whiz is heard in the situation of the pulsation. A murmur is heard also in the upper part of the sternum, and is particularly loud at the level of the fourth costal cartilage, where it is sometimes accompanied by a musical note. There is no dulness on percussion beneath the clavicle.

My diagnosis of this case is, that she has an aneurism of the ascending aorta at the point where the innominate is given off, and that this aneurism involves the innominate and the origin of the carotid artery. I do not think it an aneurism of the innominate alone, because of its being situated so much at the back of the trachea as to throw it forward by its pulsation, and also to press upon the œsophagus, and interfere with deglutition. Besides, in the only case I have seen during life of aneurism of the innominate, proved to be so after death, the tumour was smaller, rounder, and pointing more distinctly in the supraclavicular hollow.

You have here nearly all the signs of aneurism of the aorta—(1), pulsation; (2), whiz; (3), impaired deglutition; and (4), impeded circulation.

But you may say there is the same whiz at the aortic valves. What is the cause of that? It is not, I think, produced directly by aortic aneurism, but it is produced by the same original cause. An aneurism forms because there is a friability or loss of elasticity in the coats of the vessels, due generally to a deposit of white opaque matter and to a partial degeneration of them. What is more likely than the existence of the same disease in the aortic valves?

Now I come to the puzzling part of the case. You will observe that the right axillary artery is quite free; there is quite an open passage through it to supply the radial at the right wrist. Yet it is in this supraclavicular space that we have the pulsation and whiz; whereas the left axillary, though it has normally nothing to do with the innominate, is not supplied with blood, and the left arm is atrophied.

I can account for this in one way, which I might as well detail, though it is more a physiological than a medical matter. I do not bind you to accept the interpretation; and if any of you, fresh from the anatomy school, can suggest a better, I shall receive it with pleasure. In many beasts, ruminants and solidungula, and in some pachydermata—as for instance, the hog—the aorta divides into two branches, the *ascending*, giving off the two subclavians and the two carotids, while the other turns backward and becomes the *descending* aorta. On this has been founded, by the earlier anatomists, the division of the aorta into “ascending” and “descending”, a division awkward in the human species, but exceedingly applicable to the domestic animals, whence they learnt their anatomy. Now, it is by no means impossible that the patient before us may have a malformation, which is an approach to this lower condition of animal life—a malformation, of which specimens may be seen in many museums; namely, where the left subclavian, as well as the right, is given off by the innominate, and has to cross over the arch of the aorta to get to its work; and in this crossing it would be interfered with by the tumour of the top of the arch. I cannot otherwise explain the puzzle, as the tumour is not large enough to obstruct a normal left subclavian. As an argument in support of the explanation, I may mention that the patient has a congenital deficiency of the reproductive organs, curious in a social point of view for a person of her degraded occupation. She has no uterus, the vagina ending in a short *cul-de-sac*. A malformation in one part is a probable argument for it in another.

This aneurism presents several points which induce me to pronounce an unfavourable prognosis. *First*. It is in the ascending part of the aorta. Now, you will find that almost all aneurisms of the ascending aorta are rather dilatations than aneurismal sacs. They have no sharp edge, opening out suddenly into a distinct bag. And these are more difficult of cure than the sharp-edged sacs, because there is a clear stream through, and no back current, so that you cannot get clots to form in them. *Secondly*. The absence of clots is confirmed by the strength of the thrill. *Thirdly*. The supply of blood to the brain is seriously diminished, as is shown by her fainting fits. *Fourthly*. The impeded deglutition and the suspected malformation are discouraging. *Fifthly*. She is a poor anæmic woman, reduced by poverty, disease, and physicking, to a

very low state. She will not bear lowering treatment, I fear. *Sixthly.* Like many of her unhappy class, she is said to have a violent temper; so it will be difficult to keep her in the hospital, or to keep her circulation quiet while there. It is doubtful how far we shall be able to apply the treatment appropriate for the disease, and how far it will be successful, if applied. What that treatment is, I shall best illustrate to you in the next case.

Henry E., a negro, aged 21, was admitted two months ago—viz., on November 9th—into Albert Ward. He is now a commercial traveller, but during the Crimean war was a sailor in a transport, during which time he once got a severe blow on the back of the neck from a “derrick”. He says he never had cough or shortness of breath, and was always “strong in the chest”, till he began to have pain there three months before admission, especially in the left supra-mammary region. This pain increased gradually, though intermittingly. Three days before admission, while he was at his tea at Windsor, it suddenly increased very much, and he says he felt “as if something was going up and down from his heart to his arm”. He says he fell down, unable to speak, and found that he had lost the use of the left arm. On examination, it was found that the pulse in the left wrist was much weaker than in the right, and there was loss of power, though not absolute paralysis, throughout the left upper extremity. The throat was swelled on the left side, and the carotid could scarcely be felt. There was considerable swelling of the whole mammary and infraclavicular regions, in which latter also there could be distinctly made out comparative dulness on percussion. This dulness was more distinct on the third rib than immediately beneath the collar-bone. On applying the stethoscope to the third rib, a distant whizzing murmur could be heard, which increased in intensity in nearing the shoulder, and diminished towards the sternum. There was no pulsating tumour, and the lung-sounds were natural, except perhaps rather more bronchial on the left side than on the other. There was a breathing pulsation in the left jugular vein.

The signs of aneurism were not so distinct as in the last case, because it did not come so near the surface. I am inclined to think it is towards the back part of the descending part of the arch; but wherever its exact locality may be, it evidently interfered with both arteries, veins, and nerves, which supply the arm, cutting of the pulse-wave, and intercepting the nervous current, and causing swelling by obstructing the return of blood by the veins.

I thought local treatment desirable, and applied leeches several times beneath the clavicle. I should have bled him also; but, five days after admission, he fortunately caught scarlet fever from a neighbouring patient. It struck me that this might prove a substitute for venesection; it enabled us to keep him a close prisoner in bed, and to put him on very low diet. And this plan was the easier carried out from his being, like most civilised Africans, of a mild tractable disposition. It has been pursued steadily up to the present time. On December 1st, I find it noted that he had recovered the power over his arm, and that the pulses appeared nearly equal. He has continued the complete rest, and has taken prussic acid and digitalis. I cannot now detect any difference between the radials, and he has complete use of

the arm. He expresses himself as quite well, and finds a bandage which he wears across the mammary region relieves the occasional pains. There is a murmur still in the infraclavicular region; but all impediment to circulation afforded by the aneurism has ceased, and he is going to be an out-patient.

The treatment which has been adopted here is an exemplification of the principles which I have taught in the lectures on the Principles of Medicine. It is a strict following of that which nature adopts in all aneurisms that heal spontaneously. In them you find a fibrinous clot formed, and the sac shrunken up from lack of stream passing through it. We have endeavoured to make the blood disposed to form fibrinous clots, by bringing it into that fibrinous state which loss of blood, anæmia, and low diet induce; and we have endeavoured to keep the blood-stream as calm as possible by rest in the horizontal posture.

There was much in favour of this patient from the outset: the aneurism was in the descending aorta; there was no thrill; his general health was good; and he is an obedient quiet creature, very different from the ill-conditioned little woman last discussed. At all events, he has done very well; and I should urge upon you to make the carrying out of this principle of treatment the goal of your wishes in thoracic aneurism. You will find patients very often rebel, but do your best; and if you do not attain success, you will at all events deserve it.

I like in general to bleed the patients from time to time, and should have employed that mode of treatment if this man had not had the scarlet fever. A former patient of Dr. Sibson's, now an out-patient, was to have come here to day to testify from his own observation, to the superiority of venesection to leeches in its calmative influence over an aortic aneurism which he has long had, and on which he is very observant of the effect of remedies. But I suppose the frost has kept him at home.

I say you will deserve success, and sometimes you will get it. I kept a stonemason in this hospital under the bleeding and starving treatment for five weeks. He had come in with a pulsating tumour and aneurismal whiz under the left scapula, with severe pain in the floating ribs, which some thought were being absorbed. At the end of the five weeks, he rebelled; but the pulsation had disappeared, and the whiz was scarcely to be heard; and I had reason, therefore, to think the aneurism in a fair way to be cured.

Even in cases where the treatment cannot be carried out *à l'outrance*, good may be done by an approach to it. In 1851, a lady was sent to me by a surgeon in the country, to consult me about increasing corpulence and dyspnoea. In investigating the cause of the dyspnoea, I found a pulsation and an obscure whiz under the left clavicle, accompanied by deficiency of pulse in the left wrist. I was satisfied that there was aneurism either of the subclavian or of the aorta at the origin of that branch. But bleeding was undesirable, because she was so fat; and I have often told you how badly obese people bear bleeding. Moreover, she was sixty years of age. But, as she was a sensible woman, I managed to gain her confidence, and starved her for several weeks, giving her at the same time drachm doses of liquor potassæ three times a day. The effect was a reduction of her corpulence, a diminution of the

pulsation in the tumour, and greater freedom of breathing. I did not see her from 1851 till 1856, when, being in London, she called to show herself, saying how well she was. The pulse in the radial had not returned; but there was no pulsation in the tumour, and only a sort of roughness in the sound of the artery. She felt confident herself of the good effect of the starving treatment.

I have taken the opportunity of your having two patients together under your eye to bring this subject before you, because of late the objections urged against venesection in excess and in improper cases have produced a fashion of decrying its use altogether, and especially in thoracic aneurism. Bleeding and starving, say they, induce debility and anæmia; that is to say, in physiological language, they lower the force of the heart, and they cause a comparative excess of fibrine over blood-discs in the blood. These are both steps towards the mode adopted by Nature to effect a cure in aneurism, and perhaps in some other diseases also. So that, I contend, not merely is it the best mode, but that it is the only honest mode, of treating aneurism of the trunk-vessels; because it is the only one we at present know consonant to *reason* and experience.

A Lecture ON URINARY CALCULI.

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SUMMARY OF THE CHEMICAL CHARACTERS OF URINARY CALCULI.

1. *Calculi which leave only a slight Residue after Ignition.*

Uric Acid. Murexide formed when a solution in nitric acid is evaporated and exposed to the vapour of ammonia. A mere trace of residue left after ignition. Ammonia not given off when treated with a solution of caustic potash.

Urate of Ammonia. Reaction of murexide. Ammonia evolved when treated with potash.

Urate of Soda. Reaction of murexide. Fuses and gives a yellow tint to the flame. Leaves a decided residue after ignition.

Urate of Lime. Reaction of murexide. Infusible. After ignition, carbonate of lime remains.

Urate of Magnesia. Reaction of murexide. Infusible. The residue after ignition dissolves, with slight effervescence, in dilute sulphuric acid. The magnesia is precipitated from this solution, in the form of triple phosphate, upon the addition of phosphate of soda and ammonia.

Xanthine does not exhibit the murexide reaction. The solution in nitric acid turns yellow on evaporation. It is not soluble in carbonate of potassa.

Cystine is soluble in caustic ammonia, and in carbonate of ammonia. It crystallises from an ammoniacal solution in six-sided plates.

Fibrine emits an odour of burnt feathers on ignition. Solution in caustic potash precipitated by acetic acid, and also by ferrocyanide of potassium after the addition of a little acetic acid.

2. *Calculi which leave a considerable Residue after Ignition.*

Triple or Ammoniac-Magnesian Phosphate fuses in the blowpipe flame, and gives an ammoniacal odour. It dissolves in acetic acid without effervescence. Ammonia gives in this solution a crystalline precipitate of triple phosphate.

Phosphate of Lime does not fuse. Soluble in hydrochloric acid. Precipitated by ammonia in amorphous granules. From solution in acetic acid, the lime may be precipitated as oxalate when oxalate of ammonia is added.

Oxalate of Lime. Soluble in mineral acids, without effervescence. Precipitated from acid solution by ammonia. Insoluble in acetic acid. After ignition, residue effervesces freely on the addition of acids.

Carbonate of Lime. Soluble in acids, with effervescence. Lime precipitated from an acetic acid solution by oxalate of ammonia.

On the Origin and Formation of Urinary Calculi, and of the Nature of the Nucleus.

I have already had to refer briefly to this subject on two or three occasions. Whenever there is a tendency to the precipitation of any of the slightly soluble constituents of the urine in an insoluble form before the urine has left the organism, one of the conditions most essential to the formation of calculus is present. If an unusual quantity of any such substance should be formed, so that the urine contains a stronger solution of it than in health, very slight circumstances will lead to its deposition before the urine has left the bladder, and thus insoluble deposits occur. Each little mass of deposit may form a nucleus around which new matter collects; but, as a general rule, the deposit escapes with the urine. Often it would appear that on the surface, and in the interstices, of rough stones more especially, small quantities of urine are retained, and prevented from mixing with the general mass. Chemical changes soon occur, the immediate result of which is the further precipitation of insoluble material. If the urine alters in its character, different substances may be deposited; thus, oxalate of lime may form the nucleus of the calculus; and, after this has reached a certain size, the deposition of the oxalate may give place to that of uric acid. Again, the precipitation of this substance may cease, and several successive layers of phosphate may afterwards be formed. In some calculi, these layers alternate in a very remarkable manner.

The most interesting part of the whole process is the formation of the nucleus, and it is most important that we should study this matter very carefully. If we were able to ascertain the existence of calculi at a very early period of their formation, we could in many cases, doubtless, promote their expulsion before they attained any size, and thus most distressing suffering would often be prevented, and sometimes the necessity for a severe operation removed.

Any solid matter may form the nucleus of a calculus concretion. Inspissated mucus from any part of the urinary organs—crystals which have been deposited—cells of epithelium—ova of entozoa—pieces of fibrine and small clots of blood—foreign bodies which have been introduced from without, such as peas, portions of slate pencil, or tobacco-pipe, pins and needles, and other substances which are occasionally introduced into the urethra by silly persons. A piece of a catheter and bovie have also been found in the centre of a stone.

I have lately had my attention very forcibly directed to the formation of urinary calculi, in consequence of having met with many specimens of *microscopical calculi* in urine. It is not at all uncommon to meet with microscopic uric acid calculi—aggregations consisting of uric acid crystals, which, if retained, might receive deposits of fresh material on the outside, until the