A CLINICAL LECTURE ON AORTIC ANEURYSM; WITH SPECIAL REFERENCE TO SENSITIVE AREAS ON THE SKIN.

Delivered at the Edinburgh Royal Infirmary

By ALEX. JAMES, M.D.,
Physician to the Infirmary.

HISTORY AND DESCRIPTION OF A CASE.

D. R., aged 64, a joiner, formerly a soldier, was admitted to Ward 30 in the Royal Infirmary on March 9th, 1895, complaining of pains in the chest and back.

His family history was fairly good, and indicated no tendency to any particular disease. In early life he had been a soldier, and he had gone through all the hardships of the Crimean war; in later life he had been a joiner and had had occasional heavy lifts. With the exception of specific disease in his soldier days, he had had no previous illness. He had always been very temperate, well fed, and well housed. His present illness began about eighteen months ago, when he noticed that he was subject to a dull aching pain in the back of his neck. About six months ago he noticed also a pain in his chest. Those pains were of a dull boring character, and were always brought on by exertion. Recently he had also noticed some loss of power in the right arm. In spite of these pains the patient had been able to continue his work till a week ago, when they became very severe. Applying for relief to a medical man, aortic aneurysm was diagnosed, and he was recommended for admission to the Royal Infirmary.

His height is 5 feet 6 inches, his weight 10 stone 7 lbs., but he states that he used to weigh over 11 stone. His development and muscularity are fairly good for his age, and, with the exception of slight oedema of both ankles and of the right wrist, there are no very obvious morbid appearances. His appetite is good, and he states that he has no difficulty in swallowing. His digestion is also good, but, when the chest pain is severe he states that he is troubled with flatulence. On physical examination his digestive organs appear normal, except that the liver is slightly enlarged.

He makes no complaint of dyspnoea, but states that he has slight palpitation now and again. He has pain over the precordia and in the upper part of the chest generally, specially on the right side. He has also some pain in the back. As already stated, these pains are all apt to be brought on by exertion. On physical examination the heart is found to be enlarged, its impulse beat being in the sixth interspace, three-quarters of an inch external to the nipple line. Over the manubrium sterni and over the first interspace on either side of it, but more especially on the right side, pulsation can be made out. On palpation over this area the pulsation is recognised as expansile, and very heaving and powerful. Each beat directly follows that of the heart, and a distinct diastolic impulse can be made out. Percussion reveals great enlargement of the heart and marked dullness over the manubrium and parts adjoining, where, as already stated, pulsation can be seen. On auscultation over the base of the heart and over the pulsating area a slight systolic murmur is heard, and the second sound is pump-valve in character. The pulse, about 70 a minute, varies in character in the two radials, as seen in the tracings. It

Fig. 1.—Sphygmographic tracing from case of D. R.

is noted that the right carotid is also weaker than the left.

The breathing, 22 a minute, is costo-abdominal in type. There is no cough, no hoarseness of voice, no stridor. Physical examination of the lungs reveals nothing abnormal, but "tracheal tugging" is very well marked, and careful examination shows slight displacement of the trachea towards the right side.

The integumentary and urinary systems are normal. As regards the nervous system and special senses, all that need be said here is that the right pupil is much larger than the left. Both pupils, however, react readily to light and accommodation.

In this case we had no difficulty in diagnosing aneurysm of the aorta, with enlargement of the heart, especially of the left ventricle. Any valvular disease we believed, if present, to be very slight. The aneurysm seemed to involve mainly the ascending and transverse parts of the arch. Although pulsation and dullness were present to the left of the sternum, we did not believe that the descending part of the arch was involved to any extent, because there was no dullness in the left interscapular region. The enlargement of the heart we associated with the aneurysm. We could not ascribe it to any aortic valvular disease, as the pump-valve second sound negated regurgitation, and the absence of any marked systolic murmur, and the well filled arteries of the left side negated obstruction. Some authorities hold that aneurysm *per se* entails extra work upon the heart, and so causes hypertrophy, others deny this, but whether or not we may be sure that the conditions which lead to aneurysm, namely, atheroma, strain, etc., lead also to cardiac enlargement. You all know that in a case of difficulty of diagnosis between aneurysm and mediastinal tumour, an enlarged heart is a point strongly in favour of the former.

As to pressure symptoms, we believed in the first place that there was no pressure upon the gullet. The slight oedema of the legs, the enlargement of the liver, and the slight oedema of the right arm, might be ascribed to pressure on the vena cava and the right innominate vein, but the absence of distinct venous dilatation anywhere precluded the idea of the existence of any marked pressure here. As regards the trachea, we believed that the fact that it was slightly pushed towards the right, and the marked "tracheal tugging" indicated that it was involved, but in the absence of stridor, etc., we thought that it itself was not to any extent compressed. There were, however, in the smallness of the right radial, brachial, and carotid pulses distinct indications of involvement, and in connection also with the nervous system, there was distinct evidence of pressure. To these I wish now to refer in some detail.

THE DIFFERENCE IN THE PULSES.

The small pulses of the right side might be due to the innominate artery either being pressed upon by the aneurysm, or to its being partially closed by a clot at its origin from the aorta. The more sloping upstroke, curved summit, and gradual downstroke, shown by the sphygmographic tracing, with the almost complete disappearance of the predicrotic and dicrotic notches, could be explained on the theory that the dilated and expansile aneurysmal sac acted like the elastic india-rubber bag of a spray producer.

But, you will ask, if the ascending and transverse portions of the arch in this patient were dilated and formed a large elastic sac like the bag of a spray producer, why did not the tracing from the left radial show similar appearances? At the time I thought that this might be explained by supposing that the aneurysm sprang from the arch at a part close to the origin of the innominate artery, and that the greater part of the transverse portion of the arch was not dilated. But a *post-mortem* examination (the man died from slow rupture into the pericardial sac three days after his admission) showed that the whole of the ascending part of the arch outside the pericardium and the whole of the transverse portion were involved, and that the left subclavian arose from a part as dilated as was that from which the innominate arose. Hence the marked difference in the character of the tracings from the right and left radials is to be ascribed to the opening of the innominate being narrowed by a clot, and that of the left subclavian being perfectly free.

[1800]

THE NERVOUS SYMPTOMS.

As regards nerve structures involved, we have seen that in this patient the right pupil was dilated, indicating pressure upon the sympathetic on the right side, and irritation of the fibres which pass up to the pupil from the cilio-spinal region. There were no indications of involvement of either of the recurrent laryngeals, there was no hoarseness, and the vocal cords moved freely. But I wish specially to refer to the parts where pain, numbness, or other disturbances of nerve function were felt.

As you are aware, the pains about the chest, down the arms, etc., which are so often complained of in aneurysm are usually ascribed to pressure of the aneurysm upon branches of the brachial plexus and intercostal nerves, but they are much more appropriately to be referred, as Mackenzie,¹ and notably Head,² have shown, to peripheral irritation of the various segments of the spinal cord.

In this patient we had hardly time, owing to his rather sudden demise, to mark out the painful and sensitive areas sufficiently carefully, but we have two other patients with aortic aneurysm in the ward, and in them we have done so. I shall first, therefore, refer to them, and postpone alluding to this case till afterwards.

Thus Fig. 2 represents a patient D., at present in the ward.

Fig. 2.

The area A represents the position of his aneurysm as demonstrated by percussion. The shaded areas represent the parts where pain is specially felt, and where the skin can be shown to be specially sensitive to the prick of a needle. In this case we believe that the painful areas in the front of the chest, and the specially sensitive spots at the elbows, correspond to irritation of the first dorsal segment; that the painful areas along the inner aspects of the upper arms correspond to irritation of the second dorsal segment, whilst that the painful spot in the right interscapular region posteriorly corresponds to irritation of the third dorsal segment. In this case the aneurysm mainly involves the ascending arch and innominate, and, as seen, the tender areas are on both sides anteriorly.

In the second case, R., Fig. 3, in whom the aneurysm

Fig. 3.

seems to involve mainly the transverse part of the arch, the

painful chest area is anteriorly on the right side alone, and seems to correspond with the third dorsal segment. But the left arm shows, in addition to the specially sensitive spot at the bend of the elbow, an area of tenderness along its entire inner aspect. This extends right down to the fingers, where it corresponds to the distribution of the ulnar nerve, and indicates irritation of both first and second dorsal segments. Posteriorly there is a large area, symmetrical on either side. It is specially painful and sensitive, and seems to correspond with the second, third, and fourth dorsal segments.

In the patient D. R., the subject of this lecture, we had not, as already stated, time to mark out those areas carefully. It was noted, however, that, in addition to painful areas on the anterior and posterior aspect of the thorax, in addition to complaints of pain down his arms, and of occasional loss of power in his right arm, he complained of a painful spot at the back of his neck, about the vertebra prominens. This seemed to correspond with the posterior distribution of nerves from the first dorsal segment. In studying those areas in all those cases we endeavoured to discover if any precise connection existed between the locality of the aneurysm on the arch and the painful or sensitive areas. We could not, however, come to any more definite conclusion on this matter.

TREATMENT.

Our cases of aneurysm are being treated by absolute rest, low diet, and large doses of iodide of potassium, with the addition of a little chloral if iodism tends to show itself. As regards the mode of action of the iodide of potassium in such cases, there is great difference of opinion. According to some it acts by lowering the blood pressure; according to others by increasing the secretions, inspissating the blood, and so promoting clot formation; whilst a third view is that it acts by causing thickening and contraction of the sac. As to its power of lowering the blood pressure, all our observations negative this. With the sphygmomanometer we have found that no marked lowering of the pressure occurs as the result of the use of large doses of iodide of potassium, and you will remember the case of the man X. (specific disease), in whom we gradually increased the dose of the iodide till he was taking between 2 and 3 drachms a day, and in whom careful sphygmomanometric examination showed no lowering of the blood pressure.

The view that iodide of potassium causes inspissation of the blood we also do not feel inclined to accept, for in several of the patients in our ward who are taking iodide of potassium we have tested this, and we found that the specific gravity of the blood was not increased. Whether or not, however, the iodide has a special effect in causing the blood to clot more rapidly we are unable to say.

Lastly, as regards the view that the benefit of the iodide is to be ascribed to its affecting the wall of the aneurysmal sac. It is evident that as the main effect of the drug is supposed to be to promote absorption, any beneficial effect which it exercises in aneurysm must be the result of its tending to remove whatever causes the sac wall to yield, and not of its tending to increase what might cause the sac wall to contract. Hence some hold that the iodide is useful only in specific aneurysms, but on this point we cannot speak with any certainty.

DROITWICH AS A HEALTH RESORT.—A park has just been laid out near the middle of this town. Mr. Corbett, to whose munificence Droitwich owes this addition to its attractions, was fortunate enough to be able to use for the purpose a large orchard; then by skillful levelling, felling, laying out of paths, and planting, an excellent effect has been obtained. The rapidly growing popularity of the place has made it necessary to enlarge the brine baths. The Raven Hotel has again been enlarged; while the Worcestershire Hotel, which in the late summer of 1890, when a large party of medical men visited the town in connection with the British Medical Association meeting at Birmingham that year, was hardly half built, is now finished, and provides accommodation for 100 persons. Altogether, Droitwich is being rapidly transformed into a first-class health resort, especially for sufferers from rheumatism, gout, and kindred ailments. The number of visitors this year is much larger than in any former year.

¹ *Medical Chronicle*, August, 1892.

² *Brain*, vol. xvi, 1893.