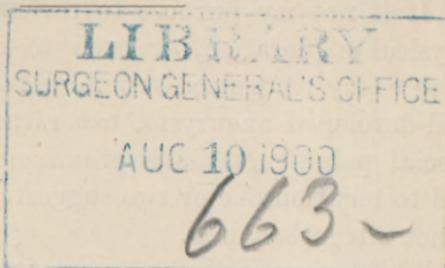


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THE EARLY DIAGNOSIS  
OF ANEURYSM OF THE ARCH.\*

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MY subject is one that in its entirety is not within the limits of the definite work of this association. So important, however, are the laryngological symptoms in many cases of aneurysm that it is now well understood that a diagnosis in cases of suspected arch lesion is not complete without laryngeal investigation. Thus it is that I do not hesitate to speak of this subject here, and even to emphasize some methods of interrogation not wholly within our special domain. Those of us who have much to do with the physical examination of the chest well know that there is nothing more difficult than to make a conclusive diagnosis in some of these cases in which the lesion of the aorta is comparatively small, and yet there is no class of cases in which the prognosis is more important.

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It is not my purpose to review the whole field of physical exploration, or even to note very fully the more easily recognized symptoms, often so apparent in well-developed aneurysm, but rather to refer to some special points not made prominent in the text-books and to mention one or two suggestions that are almost, if not altogether, new.

While many signs are more or less important, and several of these, combined, may warrant a diagnosis, yet there is only one phenomenon positively characteristic of thoracic aneurysm, and that is the presence in some part of the chest of a pulsating tumor other than the heart, which beats isochronously with the heart, and at least as forcibly, and which at each impulse expands in every direction (Balfour). In this connection it may be well also to remember that the aneurysmal pulsation is usually more forcible than that of the heart.

In the study of the evidences as presented by the average case of aneurysm, the laryngeal symptoms will naturally interest us at first. Let me at the outset recall the fact that pressure upon the recurrent nerve from aneurysm or thoracic tumor does not necessarily produce aphonia. I deem it of value to mention this because it is to be noticed that in many clinical reports the statement is made that the laryngeal evidence was negative because there was no aphonia.

The phenomenon of compensatory arytænoid movement (which formed the basis of a paper by the writer before this association in 1895) is now sufficiently established. The laryngeal image may be seen to be normal in appearance and function except in one respect—where there is paralysis of one recurrent nerve, most frequently the left, the corresponding cord may be seen

in the cadaveric position, while the opposite cord may cross the median line and phonation be possible.

In such cases, however, it is impossible that equal tension be made on both cords, and the unequal vibration will produce decided change in the voice—a hoarseness (W. T. Porter), a monotone, and inability to reach a high note (Newman, Mulhall). One or all of these symptoms may be present. Sometimes at the beginning there is not even a loss of movement, but a congestion, consequent, doubtless, upon laryngeal irritation. The only subjective symptom at this stage may be a more or less constant laryngeal cough. In some of these cases, the pressure upon the nerve being increased by the growth of the aneurysm, complete aphonia results.

It has been noticed that a bilateral adductor paralysis may be present when only one recurrent nerve is involved. It is possible (Dr. George Johnson) that one recurrent centre takes on increased and compensating action when the other fails, and, being stimulated beyond the normal, it too may, in time, fail in its function.

The dyspnoea of aneurysm, though not a constant symptom, presents many phases and should not be overlooked. When it is distinctly laryngeal, it is associated with and dependent upon motor paralysis of one or both sides. Sometimes the narrowed glottis is still sufficient for easy respiration during quiescence, but exertion produces greater inspiratory demand, and during the effort the paralyzed cords are drawn violently downward and inward, with resultant apnoea.

There may also be dyspnoea (as so well demonstrated by Newman), not only from direct pressure upon the

trachea and bronchi, but from pressure on the bronchial plexus, with consequent bronchial spasm. In one case this was the only form of dyspnoea present that I could discover, and this was increased in certain recumbent positions.

Tracheal tugging and tracheal pulsation as well as dysphagia may appear, the latter varying in intensity at times, but generally at a stage when there is other and more positive evidence, and these have received as much prominence in our books and journals as, in the present state of our knowledge, they are entitled to. The Röntgen rays give us an interesting field for study and may be of more use in the future. So far, the best pictures are, of course, those of advanced cases in which the ordinary methods of investigation are adequate, but I believe that we will have better results and definition in much earlier cases.

Pain in the region of the aorta is frequently referred to as a characteristic of aneurysm, but I have not found it a valuable or constant indication. The pain of pressure and tension, so often mentioned in the books, is not only often absent, but is almost exactly simulated in many cases of neurasthenia—in fact, in the latter condition it is of frequent occurrence. One of the most prominent physicians of my acquaintance has borne the burden of the fear of aneurysm for three years on account of the presence of the so-called characteristic pain, while the most careful physical examination has failed to find one confirmatory sign.

Far more indicative and just as frequent, in aneurysm of the arch, is a pain in the region of the fifth or sixth dorsal vertebra. I well remember a case in which this was the only symptom, so far as I could learn,

though I had no personal knowledge of the history, the patient, a man of forty years of age, dying from rupture a few minutes before my arrival. He had been treated by a noted neurologist for spinal irritation, and the autopsy showed vertebral caries from pressure. This pain may also be found in the neurasthenic, but in these cases it is lower, opposite the solar plexus, or, as a point of second selection, about the fifth cervical.

Passing the mention of the evidence to be gained by percussion and palpation and much of what is already formulated as the results of auscultation, I wish to call attention to two points which should be remembered in every suspected case. Auscultation of the left interscapular space may reveal an arterio-diastolic murmur not heard elsewhere, or there may be here or in the neighborhood a systolic murmur, due to the beating of the aneurysmal sac on the left bronchus (Gerhardt). It is heard at the same point as the pain above mentioned.

The second auscultatory phenomenon, not as yet prominently mentioned in the text-books, is the presence of a systolic sound or thud in the brachial artery, synchronous with the systole of the heart (Glasgow). Skoda and Clark have both called attention to this sound as significant in aortic insufficiency, and Dr. Glasgow well says that the same factors which are necessary to produce it in aortic regurgitation are equally necessary and often present in aneurysm.

I now wish to put on record a method of examination with which I have been experimenting for about three years. Remembering the close proximity of the aorta to the œsophagus, and that the latter is exceedingly elastic and compressible, it occurred to me that

a large bougie, with the lower end made very distensible, could be passed down opposite the site of suspected aneurysm, and the impulse conveyed to the distal end of the tube and measured. The procedure is a very simple one. The ordinary œsophageal bougie can be covered at the end with gold-beater's skin, and, after a little spraying of the pharynx with a weak cocaine solution, it can easily be passed without danger of violence to any thoracic lesion.

The tube is then distended with water and connected with a U-tube, which is also filled with water. A few drops of coloring matter will add to the demonstration of the experiment. If the tube is passed down near the cardiac orifice, the heart impulse is sufficient to produce some vibration in the tube, especially if there is hypertrophy; but if the tube is placed approximately opposite the aortic arch, very little impulse is noted in the normal case.

Where there is aneurysmal distention and impulse at this point, it is not difficult to get a more or less distinct vibration, which can be seen and estimated in the bent glass tube. In five out of seven cases under observation during the last three years the impulse could be noted by this method. I need not weary you with the details of the histories except to say that in three of these cases there was a doubt at first, even after repeated investigation by the usual methods.

I had hoped to be able to claim originality for this, but I have just found, through the kindness of Dr. Abrams, of San Francisco, that Schnell (*Münchener medicinische Wochenschrift*, July 23, 1889) has written of a method which, though not exactly the same, is certainly entitled to precedence.

More recently I have been experimenting with the auscultation of aneurysm of the arch by way of the oesophagus, which, so far as I can learn, is original, although my former experience makes me hesitate to say even this. A solid oesophageal sound with a cylindrical end, something like the well-known dilator, but with a much longer tip, is passed in the usual way. To the outer end a hard-wood disc is screwed. To this disc is applied a stethoscope, or, what I have found much better in every way, the autoscope devised by Dr. Outten and recently given to the profession. In this little instrument the sound vibration is caught and magnified by tightly stretched animal membrane, inclosed in an aluminum case, open on one side, with rubber tubes attached to aural tips. It promises to be an improvement on the stethoscopes in that there is not only a better conduction of sound but a clearer definition. Through the dense medium of the solid bougie the bruit is conveyed to the disc with great plainness. The vibrations of the latter are then determined by the autoscope. The procedure is not difficult, but, having used it only during the past winter, and in but three cases, I am unwilling as yet to compare it with the usual media of auscultation through the thoracic wall. In two of these cases the arterial bruit was certainly more distinct and positive.

