C A S E
OF
IMPERFORATE ARCH OF THE AORTA
IN WHICH
THE ROOT OF THE AORTA WAS RUPTURED.

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F. B—, æt. 24, employed at a wholesale druggist's, was admitted into St. Thomas's Hospital on December 8th, 1859. He stated, repeatedly and positively, that he had been well in all respects until the previous 21st of November; and his sister made the same statement, both at the time of his admission, and subsequently, when closely questioned, after his death. On that day—seventeen days before he was seen by me—whilst lacing his boot, he was suddenly attacked with very severe pain in the left side of the head, which, to use his own expression, almost immediately passed to the left arm and left side, and then across the lower half of the anterior part of the chest. He continued to suffer severely until four days before admission into the hospital. His breathing also became difficult; he had a sense of suffocation and palpitation; and was obliged to sit up in bed. His medical attendant told him he had disease of the heart; and also said, when all the distressing symptoms became greatly

mitigated at the end of a fortnight, that he would get well in time.

I found him in bed, with the head and shoulders much raised, and he could not long bear to be in any other position. He breathed quickly, but did not seem much distressed. Healthy respiratory sounds could be heard over the whole chest, with the exception of the space about to be described, over which there was great dulness on percussion. The boundaries of this space were between the third and fourth ribs, extending from an inch to the right of the sternum, to near the line of the left nipple; a line drawn perpendicularly downwards on the left side, and a line curved a little outwards on the right, so that at one spot it was nearly two inches from the sternum, and the margins of the ribs. The heart's sounds over the ordinary cardiac region, and in all parts to the left of the sternum, were distant and muffled; and at the base a distinct systolic bruit could be heard. There was no impulse on the left of the sternum; and, until I had examined the dull space on the right side, I was under the impression that the pericardium was distended with fluid. When this space was examined I found the heart-sounds much louder and more distinct than elsewhere; and, in the spaces between the third and fourth and the fourth and fifth ribs, close to the right side of the sternum, pulsation could be seen and felt. The pulse at the wrist was very feeble.

I saw the man on the following day about two o'clock, when he said he felt better and more comfortable. No change had then taken place in the symptoms. At four o'clock he was observed to be very pale, and to struggle a little, and he died almost immediately.

Sectio cadaveris.—With the exception of a few old adhesions, and a little congestion of the bronchial glands, the larynx, trachea, bronchial tubes, lungs, and pleuræ were quite healthy.

The pericardium was much more in contact with the front of the chest than natural. On laying it open, it appeared, at first sight, to be filled with coagulum. On further examination, however, the entire pericardial surface

was found to be lined by a thick, shaggy layer of recent, yet tolerably consistent lymph; the opposed surfaces of which were united, in many places, by adhesions. The intervals between these adhesions were occupied by a little bloody serum; and by an abundance of recently coagulated, black-currant-jelly-like blood, forming, in places, a layer three quarters of an inch thick. The greater part of this could be readily removed; but part was intimately entangled among the adhesions, so that, when the parietal pericardium was removed, the heart remained covered by a large quantity of lymph with entangled clot, and appeared much larger than natural. On removing this in part, it was seen that in the situation of the right auricle, bounded below by the auriculo-ventricular sulcus, and to the left by the great arteries, there was a rounded mass, about half the size of the fist, of what appeared to be solid coagulum, but separated from the pericardial effusion by the visceral pericardium. On opening the right ventricle, its walls were somewhat thickened and its cavity dilated. The right valves were healthy; but the tricuspid seemed to be much displaced backwards, by great expansion of the arch of muscular tissue separating it from the conus arteriosus; which arch evidently formed the inferior boundary of the mass of coagulum before alluded to, and was infiltrated with black blood up to the endocardial surface. The right auricle was evidently much encroached upon by the same mass of coagulum. The left ventricle was a little dilated and thickened. The mitral valves were healthy. That portion of the aortic orifice which is in a line with the lowest part of the valves was a little dilated; but from this point upwards, to the origin of the innominate, the aortic arch was dilated to the size of a goose's egg; the dilatation extending almost exclusively to the right and back, producing much of that encroachment on the right auricle which had appeared, at first, to be due solely to the clot. In consequence of the sudden and low commencement of the dilatation, the angles of the aortic valves had become widely separated; and the valves, consequently, expanded and

attenuated. The anterior and left curtains were blended by congenital defect into one ; a vertical frænum, which bisected the upper aspect, indicating its compound nature. The free edge of this measured two inches and a half in length. The right valve was much more attenuated than the others, presented no distinct corpus Aurantii, measured nearly nine tenths of an inch in depth, and two inches and a quarter in length along the free edge. The aortic valves seemed to be competent.

The dilatation of the aorta was chiefly behind, to the right and above the curtain last spoken of. The dilatation had a smoothly rounded form, and the walls of the ascending arch appeared smooth and healthy ; and of normal thickness. There was no trace of atheroma.

At a distance varying between three quarters and half an inch above the compound aortic valve, was a nearly horizontal, irregular laceration, measuring an inch and a half in length, which, at its centre, gaped about half an inch. It extended from the orifice of the right coronary artery to below the orifice of the anterior one. A small horizontal rupture, about half an inch in length, was situated behind the first, and about half an inch from it. These ruptures were evidently of recent date, their margins presenting no deposit of lymph or other change ; they opened, not into the pericardium or any of the cardiac cavities, but into the cardiac cellular tissue subjacent to them ; and the blood had been forced through them into the cellular tissue and into the muscular substance of the anterior wall of the right auricle, and of that arch which separates the tricuspid and pulmonic valves—forming, in these situations, the large rounded mass of coagulum before spoken of. The effusion of blood extended, though in a lesser degree, into the cellular tissue and fat around the origins of the great vessels, and separating the auricles from the ventricles.

The sequence of events producing the conditions here described was probably the following :

1. Laceration of the aorta occurring at the time of the first sudden seizure.

2. Extravasation of blood into the substance of the heart.

3. Pericarditis.

4. Escape of blood into the pericardium in consequence of rupture of its visceral layer. This probably took place immediately before death. I had seen him an hour previously, and he was then decidedly more easy than when I first saw him, twenty-four hours earlier; and no change after this time was observed until a few moments before he died.

It has already been stated that the ascending arch was very much dilated; the dilatation being aneurismal in form; but smooth and uniform, and with perfectly healthy walls. The dilatation ceased an inch below the orifice of the innominate artery; and from this point to half an inch beyond the ductus arteriosus, it was not only smaller than natural, but gradually decreased in size; and, at the point indicated, presented a congenital constriction. There can be little doubt that the constriction had been complete; but, in removing the parts, the section had been made through the aorta immediately above the point of absolute obstruction—a small hole, sufficient to admit a probe, being left. It was ascertained that the lower part of the thoracic aorta was healthy, before the nature of the congenital malformation was detected; but then, unfortunately, it was too late to examine the state of the part at, and immediately beyond the point of complete obliteration. The ductus arteriosus formed a diverticulum from the aorta about as large as a goose's quill; and was pervious up to its nipple-like termination in the pulmonary artery. The innominate and the two sub-clavian arteries were much dilated; but the carotids were of their ordinary calibre. The internal mammaries were nearly as large as an ordinary writing quill. The obstruction of the aorta not having been noticed at the time when the examination was made, no further account can be given of the mode in which the circulation was carried on.

Although this man had been accustomed to hard work

and to lift heavy weights, he had never suffered from dyspnœa, or shown any signs of heart disease, up to the period of his last attack. It is also worth noticing that there were no friction-sounds—indeed, scarcely any heart-sounds—although the pericardium was thickly coated with shaggy masses of lymph.