Aneurysm of the Descending Branch of the Right Coronary Artery, situated in the Wall of the Right Ventricle, and opening into the Cavity of the Ventricle, associated with great Dilatation of the Right Coronary Artery and Non-valvular Infective Endocarditis.

By R. Salusbury Trevor, M.B.

The specimen was obtained from the body of a girl, aged 11 years, who was admitted into St. George's Hospital, on September 4, 1911, under the care of Dr. Latham.

The history of the case was as follows: Seven days prior to admission she caught a "chill" while bathing. This was followed by a rigor, sweating, &c., pain in the left knee. For three days prior to admission there was soreness of the throat, and the legs became swollen. The only previous illness was measles six years ago.

On admission the child was flushed and restless, with a temperature of 102° F., pulse 108, and respiration-rate 28. There was no pain in or swelling of the legs. The heart's apex beat was diffuse, in the sixth space, 1 in. external to the nipple line. The area of cardiac dullness extended 1½ in. to the left of the nipple line but not to the right of the sternum. A rough systolic mitral murmur and thrill were present. The murmur was best heard 1½ in. internal to the nipple line. The lungs and abdomen were natural.

On September 8, four days after admission, a red, tender swelling appeared at the right great toe joint. There was no reaction to salicylates. Temperature 104° F. to 105° F. The heart condition was as on admission.

On September 11 streptococci were found in the blood and a vaccine was prepared. Polyvalent serum was given in the meantime.

On September 14 a to-and-fro cyclical murmur, which was very rough and scratchy, became audible, and was best heard over the tricuspid area, but was conducted over the entire præcordium.

On September 16 there was evidence of rapid dilatation of the heart, temperature remaining about 104° F.

On September 19 the patient died.

The diagnosis made was infective endocarditis and pericarditis.

I examined the body thirteen hours after death. It was fairly well nourished. The legs were slightly œdematous. Thorax: There was bilateral sero-fibrinous pleurisy with a small quantity of turbid effusion in each pleural cavity. Both lungs overlapped the pericardium, to which the pleura was lightly adherent. Both lungs were œdematous and contained numerous septic infarcts. There was general bronchitis. The infratracheal and bronchial glands were free from tubercle. In many of the intrapulmonary branches of the pulmonary artery there were tough adherent ante-mortem clots. The pericardium was normal.

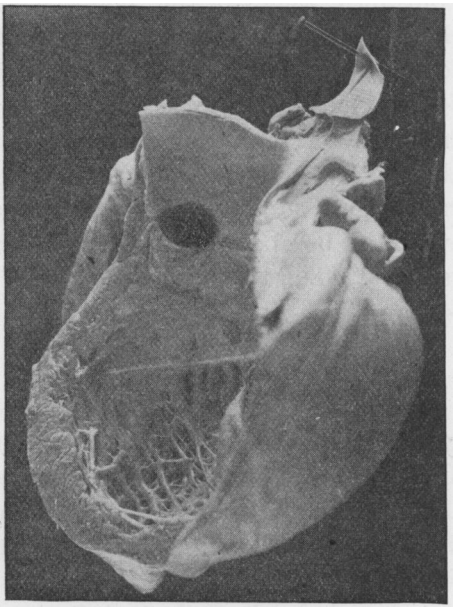

FIG. 1.

Cavity of the left ventricle, showing the large orifice of the right coronary artery.

The heart weighed 10 oz. and was rounded in shape. Both ventricles, as seen in the specimen, are dilated, the right one being especially so. The muscle in the fresh state was cloudy and pale. The heart-valves are free from vegetations, and they are all thin and flexible, with the exception of the posterior flap of the mitral, which shows slight thickening. In the cavity of the right ventricle, just to the inner side of the anterior papillary muscle, is an adherent mass of clot, guarding at its lower end a rounded or oval opening, with a maximum diameter of

¼ in., leading into the interior of a prominence on the postero-lateral wall of the ventricle. The edges of the opening are rough, and the surrounding endocardium appears ulcerated. The prominence is caused by a thin-walled fusiform aneurysm of the descending branch of the right coronary artery, situated within the muscular wall of the right ventricle. The sac is of about the size of a damson or a small plum, and the lining membrane bears some rough adherent clot at its upper part and is ulcerated below at the opening into the right ventricle. The right coronary artery is remarkably dilated. Its opening in the right sinus of Valsalva measures ½ in. across and admits the little finger easily, and the lumen continues wide to the point where the descending aneurysmal branch is given off. Beyond this point the lumen ends almost blindly, two fine holes indicating the continuation of the vessel along the auriculo-ventricular furrow. The left coronary artery is normal at its commencement and shows no obvious dilatation. The aorta above the valves shows a few patches of atheroma. Its branches were given off normally and no abnormalities in the rest of the vascular system were discovered. The abdominal organs showed cloudy swelling, and there was no ascites. The right knee-joint was healthy; the right great toe joint was unfortunately not examined.

Remarks.

Aneurysm of the coronary arteries of the heart is an uncommon lesion, and one which in consequence receives but scanty treatment in the text-books. This is the first case which has occurred during the last ten years in St. George's Hospital among a little over 3,000 post-mortem examinations.

In the *Transactions of the Pathological Society* there are records of three cases, two being cases of multiple aneurysms, and one of a single aneurysm of the left coronary artery in a man aged 50. In this case the artery showed extensive calcareous changes and the aneurysm was practically filled with clot. In the case described the physical signs suggest that the communication of the aneurysm with the right ventricle occurred five days before death, and coincided with the onset of the to-and-fro murmur which was thought to have been due to pericarditis. The date of the occurrence of the aneurysm itself can only be a matter of speculation. The impression which has been left on my mind is that it is of old date. It is on the whole smooth-walled, but the wall is remarkably thin. No communication between the artery and any of the cardiac veins can be made out.

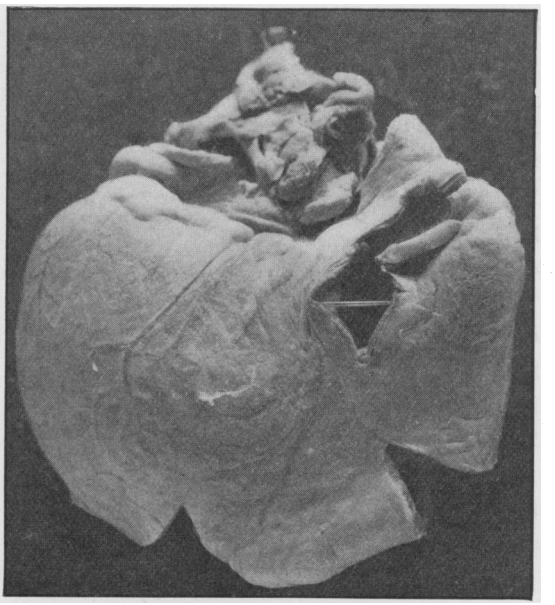

FIG. 2.

Back of right ventricle, showing the dilated coronary artery and the aneurysm (laid open) on the descending branch.

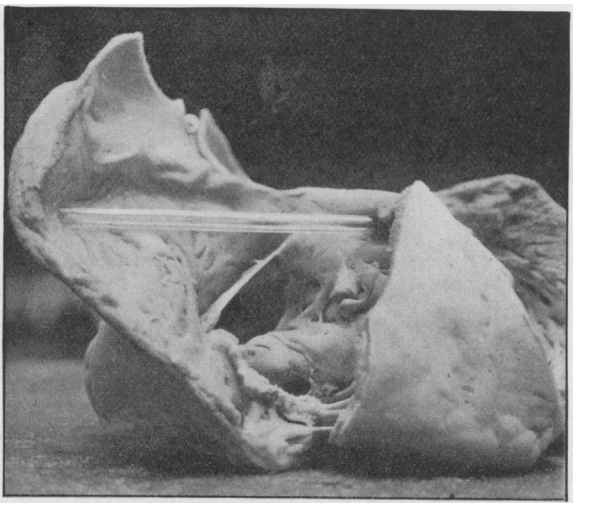

FIG. 3.

Interior of right ventricle. The round dark spot is the opening between the ventricle and the aneurysm. Above this is the tricuspid orifice.

With regard to the remarkable dilatation of the coronary artery itself, it does not seem probable that this can date from the time of rupture of the aneurysm into the ventricle. Yet it seems certain from the differences of pressure within the two ventricles that at this time the blood must have passed from the left ventricle via the coronary artery into the right ventricle, and this being so, it may be that there was a larger blood-flow through the artery. This may have led to the dilatation; but the length of time, viz., five days, does not seem sufficient to have allowed any dilatation to have assumed the size found post mortem.

The only other explanation I can offer is that the artery was anomalous at birth. If this were so, it would favour the entrance into it of septic emboli, which might perhaps account for the aneurysm found. The condition present produced clinically a murmur in many respects similar to that associated with persistent ductus arteriosus.

My thanks are due to Dr. Latham and Dr. Golla for permission to show the specimen.

BIBLIOGRAPHY.

Bristowe. *Trans. Path. Soc.*, vii, p. 98.
Jackson Clarke. *Trans. Path. Soc.*, xlvii, p. 24.
Peacock. *Trans. Path. Soc.*, i, p. 227.

DISCUSSION.

Dr. Trevor said he showed the specimen with the idea that members might be able to give him some help with regard to the causation of the condition. The dilatation of the coronary artery in this case was remarkable, and he had been unable to find among the records a case resembling it. The appearances in the artery in the specimen now were the same as he saw them at the autopsy. The vessel was white and smooth-walled, and there was no evidence to the naked eye of any acute inflammatory change in the wall. Histological examination of the vessel wall showed no evidence of acute endarteritis. The history of the case extended to only twenty-two days from the commencement of the illness, which was seven days before the child's admission to the hospital. Apparently, from the history, she had symptoms pointing to some septic infection, following what was said to be a chill. The opening which was present in the ventricle was of recent date, and corresponded with the to-and-fro cyclical murmur which had been mentioned. The alternative explanation he had put down in the notes, that the artery was anomalous at birth, seemed to be rather begging the question. He would be very glad of suggestions which might help to clear up the nature of the case.

Dr. EDMUND CAUTLEY said he did not think it was possible to make further suggestions than those which Dr. Trevor had made already. The explanation seemed a very probable one, that at some time there had been an infection which gave rise to aneurysm of the coronary artery. Whether that artery was abnormally large to start with was uncertain, because in the whole of his experience he had not heard, seen, or read of such a congenital dilatation. He thought it likely that at some time the child had had an infective embolus, carried by the coronary artery, which had caused the aneurysm. Possibly there might have been arteritis and some softening of the wall, and dilatation had occurred at the same time as the aneurysm. Subsequently, weeks or months later, the aneurysm burst and set up secondary infective endocarditis. But that was pure hypothesis.

Dr. PARKES WEBER said that although this case was doubtless absolutely unique, he thought one was justified in being almost certain that the dilatation of the left coronary artery was congenital. It was inconceivable that during the child's short illness, however much the walls of the arteries were softened, they could have dilated so much as to form an enormous artery of the size of a man's little finger. Moreover, if one supposed that this condition of dilated coronary artery was congenital, it offered an explanation of what happened when the child became infected with the sore throat, &c. As a *locus minoris resistentiæ* the congenitally diseased artery caught up the septic infection, as congenitally diseased valves frequently do, and a condition of malignant septic inflammation was started. A specially interesting point in the description of the case was the following: "On September 14 a to-and-fro cyclical murmur, which was very rough and scratchy, became audible, and was best heard over the tricuspid area, but was conducted over the entire præcordium." That was the kind of churning, rumbling murmur, extending throughout the whole cardiac cycle, which, with its intensity in another position (namely, the pulmonary area), had been described by Dr. G. A. Gibson,[1] of Edinburgh, and others, as typical of patent ductus arteriosus. In Dr. Trevor's case the position of greatest intensity was in the tricuspid area—an area, so far as he (Dr. Weber) knew, hitherto not supposed to supply that kind of murmur. It was of interest, too, that this was the second time in the present year, at this Section, that a pan-cyclic murmur had been brought forward which was not due to patent ductus arteriosus. He referred to a case shown by Dr. T. R. Whipham,[2] in which the murmur was in the same position as that described by Dr. Gibson. At the necropsy on Dr. Whipham's case it was discovered that the murmur must have been due to a vegetation from the pulmonary artery beyond the valves, hanging back and separating the valves. He had seen a case (an adult) in which a murmur probably similar to that in

[1] G. A. Gibson, *Edin. Med. Journ.*, 1900, n.s., viii, p. i.

[2] T. R. Whipham, *Proceedings*, 1911, iv, pp. 31 and 199.

Dr. Whipham's case was heard.[1] The disease was obviously of a malignant, septic type. At the post-mortem examination, however, there was no actual malignant endocarditis; the pulmonary valves were not themselves diseased, but there was a malignant endarteritis of the pulmonary artery outside the heart, and there was a rough vegetation a little beyond the valves. Perhaps the murmur in that case was caused in the same way as in Dr. Whipham's case, by a vegetation hanging back and separating the valves, though after death only the base of the vegetation was found in situ.

Dr. CHARLES W. CHAPMAN said the argument against the idea of dilatation was that there was no thinning of the vessel, which was very thick. The thickness before dilatation must have been very great.

Congenital Morbus Cordis (Cor Biatriatum Triloculare).

By R. SALUSBURY TREVOR, M.B.

THE specimen was obtained from the body of a male infant aged 4 days. The child was of good colour and showed no evidence of disease during its short life. It died suddenly in a "fit" after looking "very ghastly."

At the necropsy the body was generally dusky (cyanosed) in colour, and the finger- and toe-nails were purple. The lower lobes of both lungs were collapsed and congested, and there was much sticky mucus in the tubes. The thymus was small. The pericardium appeared normal. The heart lay in its natural position. The right ventricle formed practically the whole of the anterior aspect of the heart. The right auricle was prominent, and the left auricular appendix appeared purely rudimentary compared to the right one. Only one arterial trunk left the ventricular part of the heart.

The various anomalies present are as follows:—

(1) There is only one ventricular cavity, formed largely from what should be the right ventricle. There is a superficial interventricular furrow on the outside, but no septum within the cavity. At the apex is a small ridge of muscle tissue, which is produced by a fusion of papillary muscles, and is not a rudimentary septum.

(2) There is but one auriculo-ventricular valve, and that a valve with three flaps communicating with the right auricle.

[1] See K. Fürth and F. P. Weber, "A Case of Malignant Pulmonary Endarteritis after Gonorrhœa," *Edin. Med. Journ.*, 1905, n.s., xviii, p. 33 (especially p. 35).