TWO CASES OF AN ABNORMAL CORONARY ARTERY OF THE HEART ARISING FROM THE PULMONARY ARTERY: WITH SOME REMARKS UPON THE EFFECT OF THIS ANOMALY IN PRODUCING CIRSOID DILATATION OF THE VESSELS.

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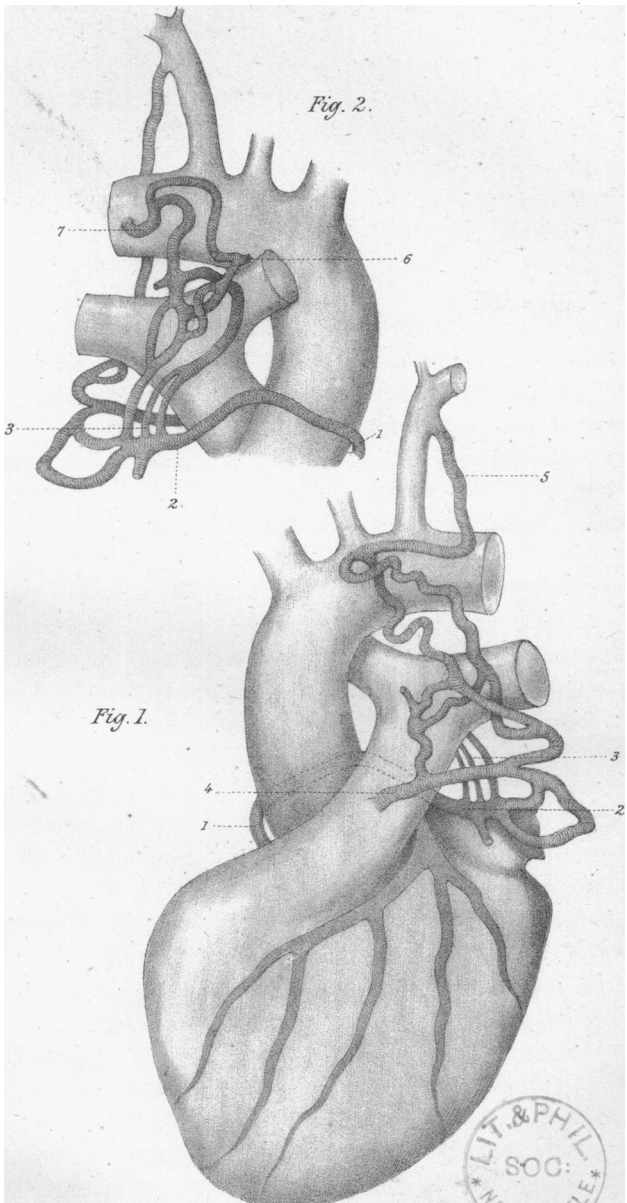
DURING the course of the Winter Session, 1884–5, two very remarkable instances of a coronary artery of the heart, springing from the pulmonary artery, occurred in the Practical Anatomy Rooms of this University. The apparent rarity of this abnormality, and the curious effect which it has in producing a cirsoid dilatation of the vessels in connection with the anomalous arteries, have induced me to put on record the two cases in question.

In the first case that was discovered, the anomalous coronary artery was a vessel which presented a calibre, corresponding in size to that of a crow-quill. It sprang from the right anterior sinus of Valsalva of the pulmonary artery, and passed downwards upon the infundibulum of the right ventricle, upon which it broke up into branches. These could be traced downwards for some distance upon the cardiac wall, and several of them were observed to anastomose with the branches of the aortic coronary arteries. In addition, however, to its cardiac twigs, others of smaller size could be detected ramifying in the coats of the pulmonary artery. The walls of this abnormal branch of the pulmonary artery were exceedingly thin, and presented characters such as one would expect to find in a vein. On slitting up the pulmonary artery its orifice was observed to be placed in a manner identical to the corresponding openings in the aorta, viz., just immediately above the free margin of the semi-lunar segment of the valve.

A consideration of this case will show that a very interesting question is connected with it? Here are two arteries belonging to the different circulations—the pulmonary and the systemic—anastomosing with each other. In these circulations, as is well



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known, the arterial pressure is very much greater in the systemic than in the pulmonary; how then did the blood flow in the anomalous coronary artery? There cannot be a doubt that it acted very much after the manner of a vein, and that blood flowed through it towards the pulmonary artery, and from thence into the lungs. The wonderful effect of such a condition on the vessels in connection with the anomalous artery is shown in the second case.

The subject in which the second anomalous coronary artery was found was an elderly male. The vessel had precisely the same origin, viz., from the right anterior sinus of Valsalva, but it was very much larger, presenting a calibre quite equal to that of the aortic coronary arteries, which were in this case of unusually large size, and very atheromatous; as in the preceding case, the origin of this vessel was placed beyond all doubt by slitting up the pulmonary artery and finding the orifice immediately above the corresponding semi-lunar valvular segment. So far as could be made out it gave no branches to the heart, but passed for a short distance to the left, and then entered a complicated mass of tortuous, thin-walled, dilated vessels, not unlike a cirsoid aneurism. This arterial mass was placed more or less around the pulmonary artery—lying chiefly behind and to the left of it, whilst a prolongation passed upwards upon the trachea and behind the arotic arch. The arteries composing it were bound together with dense connective tissue, so that it was exceedingly difficult to unravel them. Three large arteries (in addition to the pulmonary branch), entered this curious arterial arrangement. Of these one came from the right aortic coronary artery and passed behind both the aorta and the pulmonary artery to reach its destination, the second was a branch of the left subclavian, and it arose from this vessel in the root of the neck close to the inner margin of the scalenus anticus, and descended in front of the aortic arch and pulmonary artery to take part in the formation of the cirsoid mass; the third branch took origin from the posterior aspect of the transverse portion of the aortic arch, and immediately entered the arterial mass. These three channels were of nearly equal size, presenting a calibre rather greater than that of a crow-quill. They are all abnormal branches, and the question comes to be, How

have they sprung into existence. There can be little doubt that the whole arrangement of dilated tortuous vessels has arisen originally from a condition similar to that detailed in the first case, viz., from an anastomosis between a pulmonary and an aortic coronary artery. The double arterial pressure upon the walls of these vessels has led not only to their own dilatation, but has opened up channels which under ordinary circumstances are invisible. These extra channels are probably formed out of certain of the minute arteries which are given off for the supply of the coats of the great vessels. Why the tortuosity and dilatation should have occurred in the one case and not in the other, it is impossible to say. It is likely, however, that the inosculations in the second case had been originally of a more direct and larger kind.

From the cirsoid mass several arteries ran upwards upon the trachea and were evidently concerned in the supply of its wall, whilst one was traced into the lung of the right side upon the back of the bronchial tube.

The problem as to how the blood flowed in this arrangement is one of great difficulty. The three systemic arteries (viz., from the aorta, subclavian, and the right coronary) doubtless conveyed the blood into it; in all probability the pulmonary coronary branch acted as the channel by which the blood was drained away. A small quantity of the blood, however, was utilized for the supply of the trachea and the right lung.

W. Krause (quoted by Henle) records a very similar case to the first of those described in this paper. In his case, however, the anomalous branch came from the left anterior sinus of Valsalva of the pulmonary artery.[1]

EXPLANATION OF PLATE II.

Fig 1. (1) Branch from right coronary artery, about $\frac{1}{3}$ inch from its origin and passing behind aorta and pulmonary artery (indicated by dotted line); reappears at (2), where it gives off three branches (3), and anastomoses with an anomalous coronary branch (4), which arises from right anterior sinus of Valsalva of the pulmonary artery. From this

[1] *Zeitschr. f. rat. Med.*, 1865, xxiv.

anastomosis two branches ascend in front of the bifurcation of the pulmonary artery and the transverse portion of arch of aorta and join anomalous branch (5) arising from subclavian artery near origin of vertebral.

Fig 2. The three branches (3) ascend, forming a cirsoid anastomosis between the pulmonary artery and the trachea, give off (6) a branch to right bronchus and join anomalous branch (7) arising from aorta.