CASE REPORTS

Single Arterial Trunk Arising from the Aortic Arch

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SUMMARY  A 59-year-old male with a single arterial trunk arising from the aortic arch is reported. No other cases of this anomaly have been confirmed; a review of the literature does not reveal another reported case of this abnormal arterial configuration.

IN A SURVEY of aortic arch anomalies by Dr. C. Nizankowski, published in Folia Morphologica in 1975,1 a single arterial trunk arising from the aortic arch is mentioned as a possible anomaly, but no cases of this type had been found. This is the first case report of this variation of aortic arch arterial origin.

Case Report

A 59-year-old white male was admitted to the Surgical Service of the Veterans Administration Medical Center of Clarksburg, West Virginia, on October 11, 1977, because of suspected pacemaker failure. He complained of dizziness, blurred vision, and increased heart rate associated with nausea and vomiting, which began 5 hours before admission. The medical history revealed severe coronary artery disease and atrial fibrillation with a slow ventricular response that led to the insertion of a transvenous demand pacemaker in 1975. Medications which the patient had been taking were Valium, Inderal, Lanoxin, and nitroglycerin sublingually as needed for chest pain.

Physical Examination

Physical examination showed a very thin 59-year-old man in mild distress. Examination of the head, ears, eyes, nose, and throat was essentially unremarkable. Examination of the neck revealed a bruit over the left carotid artery. The left carotid pulse was barely palpable. The right carotid pulse was also diminished. Occasional scattered rales were heard in both lung bases. The heart had an irregular rhythm with tachycardia. Examination of the abdomen was unremarkable. The rectal and genital examinations were negative. Examination of the extremities revealed generalized weakness.

Hospital Course

After initial evaluation it was felt that the patient was having primary pacemaker failure; however, the ECG at the time of admission showed a rapid ventricular response to atrial fibrillation that precluded accurate assessment of pacemaker function. The patient was initially admitted to the Surgical Service for pacemaker failure, but testing with the magnet showed normal pacemaker function. Because of the marked decrease in his carotid pulses and the presence of a bruit on the left, we felt that study of the aortic arch and carotid arteries was indicated. The patient underwent an aortic arch study on October 26, 1977, as well as bilateral carotid arteriograms, which revealed a large common brachiocephalic trunk. There was complete occlusion of the right and left internal carotid arteries as well as complete occlusion of the right vertebral artery. The patient had a high-grade stenosis of the right brachiocephalic artery and severe atherosclerotic disease of the left vertebral artery.

Our Vascular Conference felt that there was no surgical remedy for this patient's occlusive disease. The patient was advised of the findings of the arteriograms and was given instructions for his activity. He was discharged on October 28, 1977.

He was last seen in the Surgical Clinic on August 1, 1979, when he stated he occasionally had dizzy spells with exertion, but less frequently than in the past. He had remarried on May 12, 1979, after being a widower for 3 years. His general health and strength had improved.

Discussion

The aortic arch study, done on October 26, 1977, shows the single trunk, which originates from the aortic arch and which then divides into a right and left brachiocephalic trunk (fig. 1). The right brachiocephalic trunk divides into the right subclavian artery and the right common carotid artery, while the left brachiocephalic trunk divides into the left vertebral, left common carotid and left subclavian arteries (fig. 2). The right and left internal carotid arteries were completely occluded, as was the right vertebral artery. The left vertebral artery was large and supplied all of the cerebral circulation. There was

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Figure 1. Early film of the aortic archogram showing the single brachiocephalic trunk at its origin from the first portion of the aortic arch.

Figure 2. Later film of the aortic archogram showing the common brachiocephalic trunk dividing into a right and left brachiocephalic trunk.

Figure 3. A drawing of the configuration of the vessel and branches coming off the aortic arch.

Marked stenosis of the midportion of the right brachiocephalic trunk and severe atherosclerotic disease of the distal left vertebral artery. A bilateral direct carotid needle puncture and hand injection of the common carotid arteries with contrast material confirmed the information obtained from the aortic archogram. Figure 3 was drawn to clarify the configuration of the vessel and branches coming off the aortic arch.

Dr. Kurt Amplatz and Dr. Wilfrido Castaneda of the Radiology Department of the University of Minnesota reviewed the x-ray films and confirmed the diagnosis of a single aortic trunk.

This is the first reported case of a single brachiocephalic trunk originating from the aortic arch and then dividing into right and left brachiocephalic trunks.

Reference

Single arterial trunk arising from the aortic arch.
D E McDowell, M A Grant and R A Gustafson

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