Arteriovenous Fistula of Ascending Aorta and Left Innominate Vein

Report of a Case with Successful Surgical Repair*

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DUE TO THE infrequent survival of patients with lacerations of the ascending aorta and adjacent veins, acquired arteriovenous communications in this location are rare. In the literature there are only two instances of successful closure of such defects.[1, 2] In this clinic a patient was successfully treated for an arteriovenous fistula between the left innominate vein and the ascending aorta. This experience forms the basis for this report.

CASE REPORT

The patient was a 25-year-old Indian male, admitted to the hospital on July 23, 1953. His complaints were dyspnea, ankle edema, and fatigability.

Six years before admission the patient was stabbed in the upper chest with a long, thin knife. The patient escaped with the knife still in place and returned to his home a short distance away. He then pulled the knife from his chest and became unconscious. On regaining consciousness, he was in a hospital. After a slow convalescence he returned to heavy manual labor. Four years later he began to have episodes of dyspnea, substernal pain, and vertigo related to exertion. Because of progression of these symptoms, he became so ill that even constant medical treatment was ineffective.

Physical examination showed his blood pressure to be 140/60–0 in the right arm and 130/60–0 in the left arm. The peripheral pulses were bounding. His heart was enlarged to the left. Over the sternum at the level of the second costal cartilage there was a palpable thrill and a continuous murmur more intense on the left. At this same level there was a healed 1 cm. scar in the skin.

The liver was palpable below the costal cage. There was moderate pedal edema.

The accessory clinical findings showed the hemoglobin to be 11.0 Gm., while the white blood cell count was 8,950 with a normal differential. The urine examination showed the pH to be 5.5; specific gravity, 1.107; the sugar and albumin tests were negative, and microscopic findings were normal. Serological tests for syphilis were negative.

The electrocardiogram showed a normal sinus rhythm without axis deviation. The heart on roentgenologic examination was greatly enlarged in all chambers.

A catheter was introduced into the right basilic vein, and passed into the right innominate vein. Arterial blood was aspirated from the latter vein.

The patient was treated with Digitoxin, mercurial diuretics, and low salt diet for 14 days. This controlled his heart failure to the point that surgical exploration was feasible.

On August 1, 1953, the chest was explored through an anterior incision extending from the right anterior axillary line to the left mid-clavicular line, going through the third interspace. On opening the anterior mediastinum there was surprisingly few collateral venous or arterial channels encountered. The right and left innominate veins and superior vena cava were greatly dilated. Over these 3 veins there was a palpable machinery thrill, more pronounced over the left innominate. By palpation through the left innominate vein a communication between this vessel and the ascending aorta was easily outlined. The pericardium was then opened, and the ascending and transverse aortic segments were mobilized. Then the left innominate vein was freed except for its attachment to the aorta. The innominate and left carotid arteries were isolated. It was then possible to pass a tape around the venous side of the arteriovenous tract, and to occlude the fistula completely (Fig. 1). Then a Potts-Smith aorta clamp was placed on the aortic arch in such a way that the left common carotid artery and aorta remained patent, while the innominate artery was occluded, and the fistula isolated. The fistula was visualized by an incision into the innominate vein. The aortic wound was 1 cm. in length, and extended to the base of the

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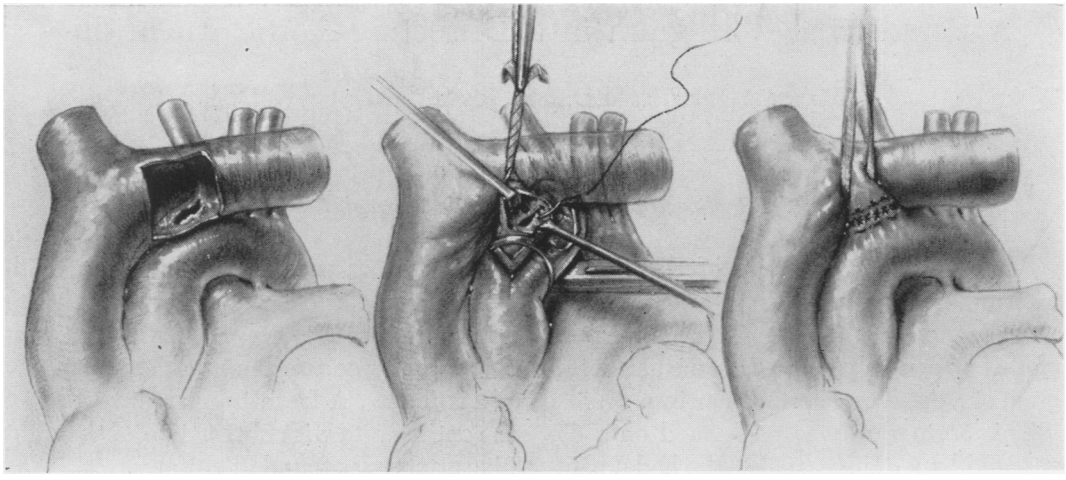

FIG. 1. Artist's drawing of the steps in the successful repair of an arteriovenous fistula between the ascending aorta and the left innominate vein.

innominate artery. By interrupted sutures the wound in the aorta was closed and further reinforced by imbricating the tract and vein wall down over the suture line. This effectively obliterated the fistula.

There were no complications other than mild jaundice after operation. The patient left the hospital 4 weeks after operation, greatly improved.

A follow-up examination a year later revealed the heart to be of normal size, and on physical examination there was no evidence of recurrence of the fistula. He had no cardiac symptoms, and was working full time.

SUMMARY

A case of an arteriovenous fistula of the ascending aorta, with the left innominate vein, is reported. A method for isolation and repair of the fistula, with maintenance of circulation, is reported.

BIBLIOGRAPHY

1 McCook, W. W.: Arteriovenous Fistula of Aortic Arch. J. Thoracic Surg., **23**: 299, 1952.

2 Proctor, W. H., Jr.: Arteriovenous Fistula of the Aortic Arch. J. A. M. A., **144**: 818, 1950.