Coarctation of the Aorta

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THE nation's increasing demands for conservation of manpower requires the retention of young men and women in the military service, and reconsideration may well be given to the question of certain congenital cardiovascular defects which have occasionally been the cause for separation from the Armed Forces. The correction of the adult type of coarctation of the aorta by surgical means should permit a person to perform full military duties and should alter the previously unfavorable prognosis for normal longevity. Persons of military age suffering from coarctation of the aorta are easily detected by noting the presence of an elevated blood pressure in the upper extremities and the absence or weakness of arterial pulsations with a decreased or absent blood pressure in the lower extremities. Arterial angiography is an adjunct in the diagnosis of this condition. The condition is usually correctable in young adults, and patients are thereby restored to full physical fitness for military duty. Three patients treated during recent months are briefly reported.

CASE REPORTS

Case 1.—A robust 17-year-old student at an Air Force Training School complained of repeatedly going to sleep while attending classes. He was a high school graduate but had not participated in athletics as his family physician had advised against such activities because of high blood pressure. A thorough clinical investigation revealed full and bounding radial pulsations; brachial blood pressure between 190/100 and 150/100; impalpable femoral pulsations; and no audible blood pressure in the right leg and in the left leg a feeble but audible pressure of 100/80. The heart sounds were easily heard throughout the left thorax and a grade II systolic murmur was present. Visible pulsations were noted on the chest wall in the region of the tenth rib. Roentgenograms revealed notching of the under-surface of the left fifth and sixth and the right sixth and seventh ribs. Angiocardiography was unsatisfactory. A diagnosis of coarctation of the aorta was made and an operation per-

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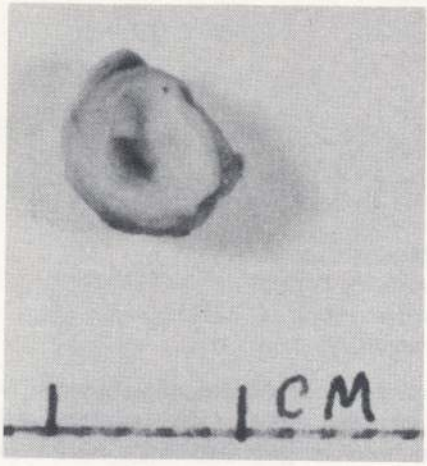

Figure 1.—Lumen of resected aorta showing coarctation.

formed. The coarctated area was about 7.5 mm. long. The aorta both proximal and distal to the coarctated area was appreciably narrowed. The subclavian artery was quite large and anastomosing it to the aorta was considered, but this was not done. The coarctated area was resected and the two ends of the aorta sutured after the methods of Crafoord and Nylin *(3)* and Gross *(4)*. The lumen of the coarctated area was constricted to a diameter of only 1.2 mm. (fig. 1). The new opening resulting from the anastomosis of the two ends of the aorta was 1 cm. in diameter. The postoperative course was uneventful. The patient noted a definite increase in the warmth of his lower extremities. The postoperative brachial blood pressure was 140/80 and in the lower extremities was 110/84. The patient returned to full military duty and a favorable prognosis as to longevity is predicted.

Case 2.—A 29-year-old man who had been in the military service for 10 years had been hospitalized 7 times in that period and had received medical attention on several other occasions for minor illnesses and injuries. He had been examined for re-enlistment twice, treated by private physicians because of high blood pressure, and his application for life insurance had been rejected by a commercial company. He was admitted to Fitzsimons Army Hospital in June 1950. For 3 years prior to admission he had intermittent, severe headaches lasting from 6 to 12 hours and often associated with nausea. In October 1949 he fainted while engaged in moderately strenuous work. His blood pressure was equal in both arms and varied from 160/90 to 190/110. There was a systolic cardiac murmur. The blood pressure was not audible in either leg. Electrocardiograms revealed first degree atrioventricular block and defective intraventricular conduction. Roentgenograms of the chest revealed notching of the third to fifth ribs on the left. The retinal vessels were tortuous with increased light reflexes. A diagnosis of coarctation of the aorta was made. He underwent surgical excision of the coarcted area and an end-to-end anastomosis of the aorta on 27 June. A section of the aorta 1 cm. long was removed. The lumen of the excised vessel tapered abruptly to a slit-like orifice with a patency which

(3) Crafoord, C., and Nylin, G.: Congenital coarctation of aorta and its surgical treatment. J. Thoracic Surg. 14: 347-361, Oct. 1945.

(4) Gross, R. E.: Discussion of motion picture presentation on "Surgical Treatment of Coarctation of the Aorta" by Dr. Clarence Crafoord. J. Thoracic Surg. 16: 256-257, 1947.

could not be demonstrated without trauma to the tissues. The postoperative course was uneventful. Postoperative blood pressure in the lower extremities varied from 110/70 to 120/80 and the femoral arterial pulsations were forceful. The patient returned to full military duty with the military police. The determination of the blood pressure in the lower extremities earlier in his career would doubtless have revealed information leading to the diagnosis of coarctation of the aorta.

Case 3.—A 19-year-old soldier was hospitalized in Germany in March 1950 because of an acute upper respiratory infection. Physical examination revealed a brachial blood pressure of 180/94 bilaterally, a loud systolic murmur heard over the entire anterior portion of the chest, no audible blood pressure in lower extremities, indistinct pulsations of the femoral vessels, and absence of pulsations in the popliteal and ankle areas, bilaterally. The ECG was normal. Roentgenograms of the chest revealed notching of the left fourth and fifth ribs. Because of these findings, a clinical diagnosis of coarctation of the aorta, adult type, was made and the patient was transferred to Fitzsimons Army Hospital for operation. The aorta was found to be markedly constricted an inch below the junction with the left subclavian artery which was markedly enlarged. The coarctated area was excised and an end-to-end anastomosis of the aorta performed. The internal diameter of the coarctated area was less than 2 mm. Femoral pulsations were easily palpable immediately after operation and the postoperative blood pressure in the lower extremities was 140/105 and in the upper extremities was 140/95 bilaterally. Popliteal and dorsalis pedis arterial pulsations were easily felt. The patient returned to full military duty and participated actively in sports. This case report illustrates the ease with which the diagnosis of the adult type of coarctation of the aorta can be made.

SUMMARY

Coarctation of the aorta is occasionally encountered in military personnel. The diagnosis is easily made if the blood pressure is taken in all extremities in young adults with hypertension. The surgical correction of this defect permits the patient to perform full military duty, altering an unfavorable prognosis as to longevity to normal.