Double Aortic Arch with Aneurysm-A Surgical Case Report

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ABSTRACT: An unusual case of double aortic arch with aneurysm is described. A 61-year-old, hypertensive and syphilitic male patient complained of increasing difficulty in swallowing of approximately five months duration. Barium swallow and subsequent aortography showed the presence of an aneurysm of the ascending aorta involving the left (anterior) arch of the double aortic arch. The tightening of the vascular ring by aneurysmal dilatation of the left aortic arch appeared to be responsible for the delayed onset of the symptom. Surgical correction was made by removing the aneurysmal ascending aorta and left aortic arch and a Dacron graft was inserted between the ascending aorta and the right (posterior) aortic arch. The patient died of cerebral complication about forty hours postoperatively. Surgical problems associated with this unusual condition were discussed retrospectively from the operative and autopsy findings. In reviewing the pertinent literatures this case appeared to be the first operated case of double aortic arch associated with aneurysm.

KEY WORDS: Double aortic arch, Aneurysm, Surgical correction.

INTRODUCTION

A double aortic arch may produce severe symptoms and sings in early infancy from the compression of the trachea and/or esophagus. Occasionally, however, it may remain asymptomatic and its discovery is incidental. In other instances a vascular ring develops symptoms first in an older age due to compression of the trachea or esophagus by dilatation of the ring constituting artery. In an extensive review of the literature Griswold and Young found double aortic arch associated with an aneurysm in a 43-year-old male with compression symptom developing first a few months before death. The purpose of the present report is to present an unusual case of aneurysm involving the ascending aorta and the left arch of double aortic arch and to discuss the problems raised by the surgical and autopsy findings.

CASE REPORT

A 61-year-old male was referred to Beppu National Hospital in February 1973 with a tentative diagnosis of aneurysm of the ascending aorta. He complained of increasing difficulty in swallowing and a dull chest pain for five months prior to the admission. He was neither dyspnoic nor cyanotic. Blood pressure was 188–66 mmHg. ECG. was within normal limits. Positive serologic tests for syphilis appeared to be pathognomic in the otherwise almost non-contributory laboratory tests. Chest x-ray revealed an essentially

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normal sized heart and a slightly enlarged ascending aorta. A barium swallow showed that the esophagus was severely compressed and indented from the right and from behind in the lateral and right anterior projections (Fig. 1 and 2). A subsequent aortography confirmed the presence of double aortic arch. In addition, the ascending aorta showed an enormous diffuse aneurysmal dilatation, occupying almost the entire retrosternal space. The initial portion of the left aortic arch was markedly dilated and appeared to constitute part of the aneurysm. There was little regurgitation of the contrast media into the left ventricle (Fig. 3 and 4). These findings appeared to indicate that the aneurysm involved the ascending aorta as well as left arch of double aortic arch which in turn was constricting the esophagus progressively. Therefore surgical intervention was proposed consisting of dissection of the aneurysmal ascending aorta and left arch and insertion of a graft between the stump of the ascending aorta and the right aortic arch.

On February 22, 1973, operation was performed under a surface cooling deep hypothermia (20°C rectal). The mediastinum was entered through a midline sternal split. A large, fusiform aneurysm, about 7 cm in diameter, of the ascending aorta involving almost the entire left arch of a double aortic arch was found (Fig. 5). The left arch passed in front

Fig. 1. Chest x-ray film in p-a projection with barium in the esophagus (Retouched). Somewhat broadened superior mediastinum. Very severe compression of the esophagus from the right at the level of aortic knob.

Fig. 2. Chest x-ray film in the first oblique position. Barium swallow revealing severe compression of the esophagus from behind in the upper mediastinum and slight compression from front in the midportion. Note the large, roundish mass compressing the esophagus from behind (the right aortic arch).