Early Morbidity and Mortality After Second Step of Staged Management of Extensive Aortic disease.

Thesis

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By

AHMAD ABDELSATTAR ABDELAZIZ DAOUD
(M.Sc)

Under Supervision of

PROF. DR. SAMIR ABDALLAH HASSAN
Professor of Cardiothoracic Surgery,
Faculty of Medicine, Cairo University

PROF.DR. SAID ABDELAZIZ BADR
Professor of Cardiothoracic Surgery
Faculty of Medicine, Cairo University

ASS.PROF.DR. ALAA ELDIN FAROUK MOHAMED
Assistant Professor of Cardiothoracic Surgery
Faculty of Medicine, Cairo University

DR. AHMED ABDELAZIZ ELSHARKAWY
Lecturer of Cardiothoracic Surgery
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
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Introduction

Extensive aortic disease stands for diffuse arteriosclerotic disease, coarctation, aneurysmal dilatation or dissection involving two or more segments of the aorta, which may include the ascending aorta, aortic arch, descending thoracic or abdominal aorta[1].

Patients with extensive aortic diseases are still considered to be a challenge for many cardiovascular surgeons. The relatively proximal segment of the descending aorta (the proximal 1/3 of the descending aorta) can be operated upon via the median sternotomy, but this one-stage approach is often difficult because of poor and limited operative access combined with an increased risk of bleeding from distant sites. Therefore, many surgeons prefer a two-stage approach to treat the combined lesions of the aortic arch and the descending aorta, especially when the extent of the aneurysms is beyond the proximal 1/3 of the descending aorta.[2]

The introduction of the elephant trunk technique by Borst et al. in 1983 has greatly facilitated surgery on this kind of pathology and this technique has been recognised as the standard modality for treatment of extensive aortic diseases. In a second-stage operation, the elephant trunk can be extended to any desired level through a lateral thoracotomy [3].

Since the introduction of endovascular stent-graft technology as a second stage for management of extensive thoracic aortic diseases by Dake et al. in 1998, it has been considered as an alternative treatment modality that may be associated with reduced mortality and morbidity [4].

Our study is a descriptive both retrospective and prospective non randomized study over 30 patients with extensive aortic disease underwent first stage repair of the aorta and to whom a second stage of repair is done in our centre using surgical approach or endovascular stenting (TEVAR/ EVAR) of the diseased part of the descending thoracic, abdominal aorta or arch after de-branching in the first stage.

Aim of the Work

Aim of this study is to report early results of second step of staged repair of extensive aortic disease either by surgery or by endovascular repair of the aorta (TEVAR/ EVAR).

Review of Literature

Anatomy of the aorta

The aorta is the major arterial conduit conveying blood from the heart to the systemic circulation. It originates immediately beyond the aortic valve ascending initially. Then it curves forming the aortic arch, and descends caudally adjacent the spine. The ascending thoracic aorta gives off the coronary arteries. The aortic arch branches are typically the brachiocephalic trunk (branches to the right common carotid and right subclavian arteries), left common carotid and left subclavian arteries; however, aortic arch anatomy is variable (figure 1) [5].

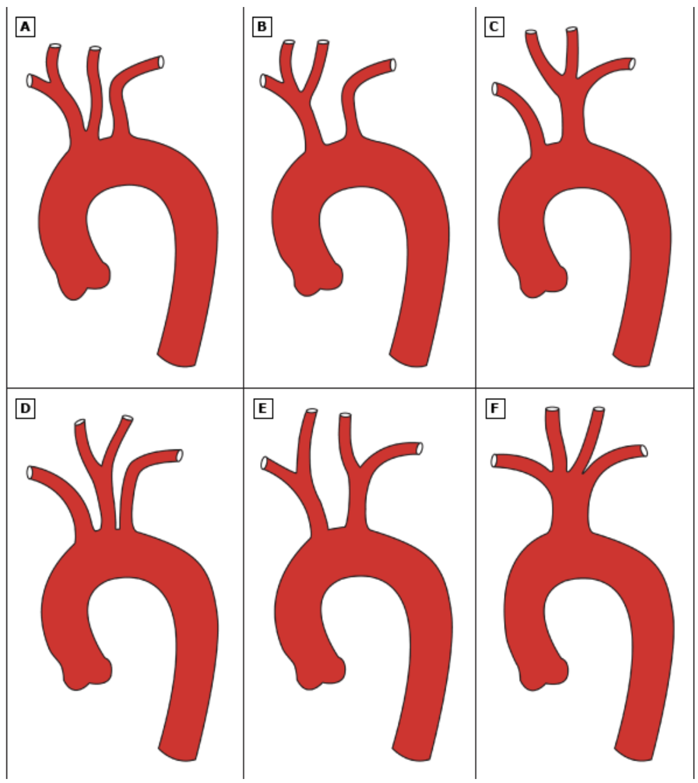

Figure 1; Variations in the origin of the aortic arch branches.

(A) and (B) represent the majority of anomalies found in the general population.
(A) Common origin of the left common carotid artery and brachiocephalic artery (bovine arch). Represents 73 percent of all branch variations.
(B) Origin of the left common carotid from the mid- to upper brachiocephalic artery. Represents 22 percent of all branch variations.
(C) Common carotid trunk giving origin to the left subclavian artery.
(D) Common carotid trunk, independent from both subclavian arteries.
(E) Left and right brachiocephalic arteries.
(F) Single arch vessel (brachiocephalic artery) originates the left common carotid and left subclavian arteries.

The descending thoracic aorta provides paired thoracic arteries (T1-T12) and continues through the hiatus of the diaphragm to become the abdominal aorta which extends retroperitoneally to its bifurcation into the common iliac arteries at the level of the fourth lumbar vertebra (figure 2) 5. The abdominal aorta lies slightly left of the midline to accommodate the inferior vena cava which is in close apposition. The branches of the aorta (superior to inferior) include the left and right inferior phrenic arteries, left and right middle suprarenal arteries, the celiac axis, superior mesenteric artery, left and right renal arteries, left and right internal spermatic arteries, inferior mesenteric artery, left and right common iliac artery, middle sacral artery and the paired lumbar arteries (L1-L4).

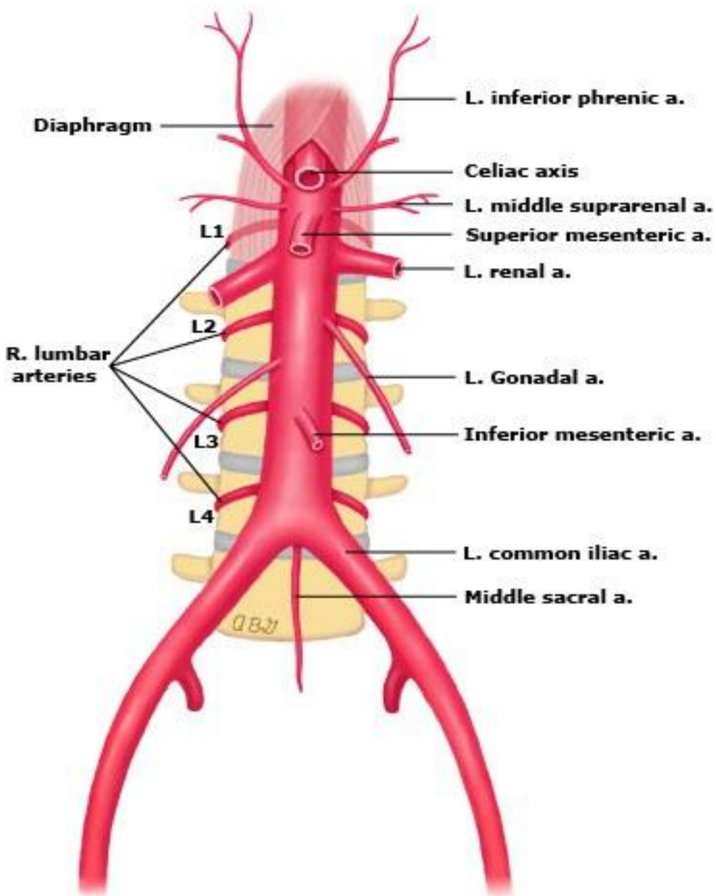

Figure 2; Anatomy and branches of the abdominal aorta.

The common iliac artery bifurcates into the external iliac and internal iliac arteries at the pelvic inlet. The internal iliac artery gives off branches to the pelvic viscera and also supplies the musculature of the pelvis. The external iliac artery passes beneath the inguinal ligament to become the common femoral artery [6].