

بسم الله الرحمن الرحيم

وقل رب زدني علماً

صدق الله العظيم

القرآن الكريم - الجزء السادس عشر

سورة طه - آية رقم ١١٢

Atherosclerotic Disease of the Ascending Aorta and Cardiac Surgery

An Essay

*Submitted for Partial
Fulfillment of Master of General Surgery*

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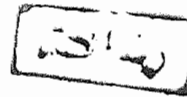
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1993



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ACKNOWLEDGMENT

All thanks are due to God.

I would like to express my deepest gratitude to our professor Dr. Ismail A. Sallam, Professor and Head of Cardio-thoracic Surgery, Ain Shams University, who honored me by his kind supervisions, continuous help and fatherly advice in all stages of this work.

No word can fulfill the feeling of gratitude and respect carry to professor Dr. Ezzeldin Mostafa, Professor of Cardio-thoracic Surgery, Ain Shams University, for this great directions all through this works with a scientific personality and a kind heart.

In this opportunity, I would like to express my gratitude and unlimited thanks to all staff members of Cardio-thoracic. Surgery Department in National Heart Institute for their kind support and help.

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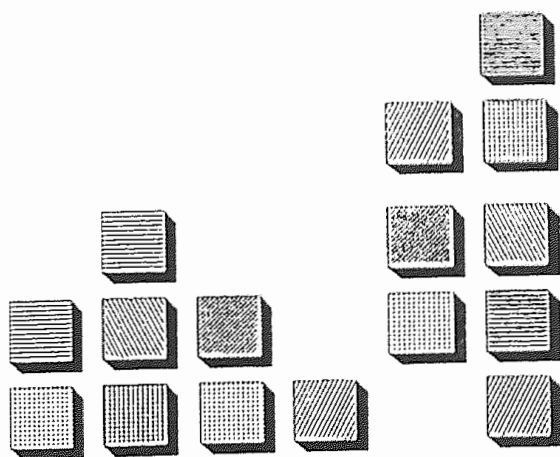
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Arabic Summary	
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LIST OF ABBREVIATIONS

AAA	Abdominal Aortic Aneurysm
AI	Aortoiliac Occlusive Arterial Disease
CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
COPD	Chronic Obstructive pulmonary Disease
CPB	Cardiopulmonary Bypass
CPK	Creatine Phosphokinase
CT	Computed Tomographic Scan
CVA	Cerebrovascular Accident
IMA	Internal Mammary Artery
SV	Saphenous Vein

Introduction And Aim Of The Work



Introduction And Aim Of The Work

Analysis of many patients who underwent coronary artery bypass revealed patients with mild, moderate or severe atherosclerosis of the ascending aorta. The prevalence of stroke in patients with the severe type of aortic disease prompted development of a new operative technique that has been used in some patients. It involves a "no-touch" technique of the ascending aorta where upon the proximal saphenous vein-internal mammary anastomoses are performed end-to-side anastomoses (Mills, N.L., Everson, C.T., 1991).

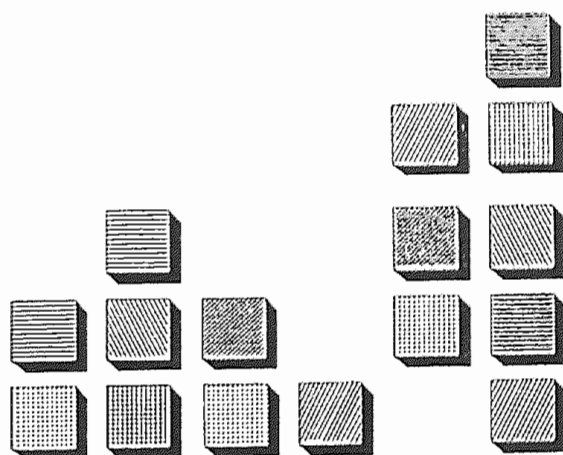
Ascending aortic atherosclerosis must be suspected in all coronary bypass patients with associated significant carotid, abdominal aortic and main left coronary artery disease, aortic wall irregularity on ascending aortic angiography, adhesions between the ascending aorta and its adventitia, pale appearance of the ascending aorta and minimal bleeding of an aortic cannulation stab wound.

It must be avoids any manipulation of the ascending aorta and that uses the internal mammary arteries as the sole source of blood supply for coronary bypass is an effective method to prevent aortic clamp injury "trash heart" or stroke from severe ascending aortic disease (Mills, N.L., Everson, C.T., 1991) (Coselli, J.S., Crawford, E.S., 1986).

The Aim of This Work

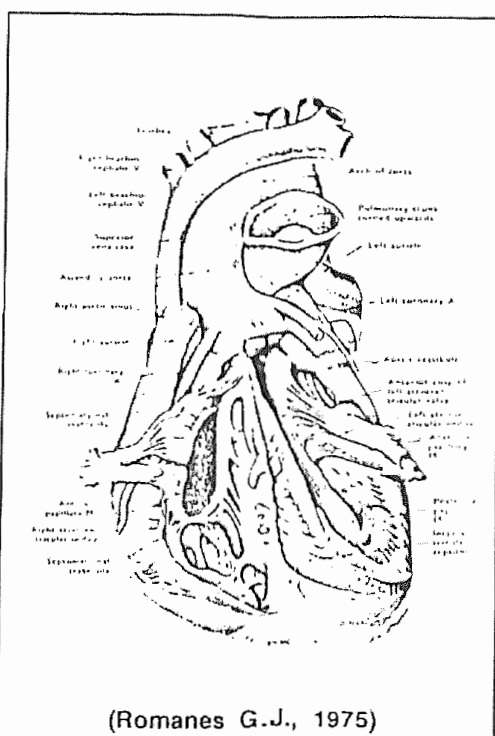
To study the optimal management for patients with atherosclerosis of the ascending aorta undergoing cardiac surgery trying to prevent the potential complications of embolization, dissection, mural laceration and haemorrhage.

Anatomic Considerations Of The Ascending Aorta



Anatomic Considerations Of The Ascending Aorta

The ascending aorta arises from the base of the left ventricle behind the left sternal margin opposite the third costal cartilage. The aortic bulb, the dilated origin of the aorta, contains three secondary dilatations, the aortic sinuses, which correspond to the three semilunar cusps of the aortic valve. The right and left



coronary arteries spring from the corresponding aortic sinuses. At the second right costal interspace the aorta is covered only by the thin anterior lappet of the right lung, so that at this point, the aortic sound can be heard most readily. The ascending aorta

is completely enclosed by the pericardium. The superior vena cava lies on its right and the pulmonary on its left (Anson, B.A., McVay, C.B., 1971).

The bulb of the aorta is a swelling of the right border which receives the full thrust of the blood discharged from the left ventricle. This is a common site for the formation of an abnormal dilatation - an aortic aneurysm (Romanes, G.J., 1984).

Arch of Aorta

The arch begins posterior to the right half of the sternal angle. It passes posteriorly with a slight inclination and convexity to the left, while arching superiorly into the inferior part of the superior mediastinum. The convexity to the left is caused by it arching from the front of the trachea over the left side of that structure and of the oesophagus to join the descending aorta on the left of the disc between the fourth and fifth thoracic vertebrae in the same horizontal plane as its origin. The superficial surface of the arch is in contact anteriorly with the remains of the thymus, and is crossed by the left brachiocephalic vein near the roots of its branches. Further posteriorly the phrenic nerve, the cervical cardiac branches of the left vagus (inferior) and sympathetic intercostal vein cross its left surface.

The inferior or concave surface of the arch curves over the structures passing to the root of the left lung. It is in contact with the bifurcation of the pulmonary trunk and the left pulmonary artery, and also with the left bronchus. In addition, the ligamentum arteriosum passes from the root of the the left pulmonary artery to the arch, and the left recurrent laryngeal nerve passes posterior to the ligament to reach the groove between the trachea and oesophagus medial to the arch. The superficial cardiac plexus lies inferior to the arch on the ligamentum arteriosum (Romans, G.J., 1975).

Branches of Arch

Brachiocephalic Trunk

This artery, the largest of the three branches, begins behind the centre of the manubrium sterni, anterior to the trachea and posterior to the left brachiocephalic vein. It passes superolaterally to reach the right side of the trachea and end posterior to the upper margin of the right sternoclavicular joint by dividing into the right common carotid and right subclavian arteries anterior to the dome of the pleura. It may gives rise to the small thyriodea ima artery, which ascends on the front of the trachea to the isthmus of the thyroid gland (Romans, G.J., 1975).