

POSTINFARCTION LEFT VENTRICULAR
ANEURYSM RESECTION (ANEURYSMECTOMY)
(RETROSPECTIVE STUDY)

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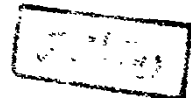
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contain and localize the rupture, forming an aneurysm with an outer wall composed of noncontractile fibrous pericardium. Such lesions are referred to as a "false ventricular aneurysm" or "pseudoaneurysm" (Spindola, 1978) See. (Fig.1). The separation of a "true" from "pseudoaneurysm" of left ventricle has important prognostic implication, as true aneurysm has a very small likelihood of rupture, and a pseudoaneurysm has 45% incidence rate of rupture (Higgins, 1978).

Most aneurysms can be described as "chronic". They form slowly and become symptomatic many weeks to months following an acute myocardial infarction. Disability and death from left ventricular aneurysms in most patients depend not upon frank rupture and exsanguination, as for aortic or other arterial lesions, but upon the physiologic effect on cardiac performance. (Cooley, 1980).

Patients with postinfarction left ventricular aneurysms present with two coexisting problems, one is the mechanical disadvantage of the aneurysm itself, and the second is the functional impairment of the residual contracting section of the left ventricle caused by additional coronary obstruction (Gelberge, 1979). The haemodynamic impairment of the paradoxically expanding ventricular segments, coupled with chronic ischaemia of

residual nonaneurysmal myocardium may present with:

- Cardiogenic shock
- Refractory ventricular dysrhythmia.
- Medically refractory congestive heart failure.
- Medically refractory angina pectoris. (Grondin, 1979).

Another threat to the patients is peripheral embolism from dislodgement of the contained intraaneurysmal thrombus, a complication that occurs mostly in the acute phase of development (Cooley, 1980). However, although, 20 - 25% of patients have clots in the aneurysmal sac, systemic emboli are uncommon complication (Cabin, 1980).

Prognosis:

It was reported by Gorlin 1967, Cabin 1980, Barratt-Boyes 1980, that survival in patients who manifest a left ventricular aneurysm after a clinically documented myocardial infarction is clearly diminished compared with that in patients with healed myocardial infarction unassociated with aneurysm formation. Schlichter (1954) reported that 88% of patients died within 5 years of the diagnosis of aneurysm, with 70% succumbing to CHF. Dunbow, (1965), reported a 73% mortality rate at 5 years while Davis (1972) found that the average time from initial myocardial infarction

asymptomatic ventricular aneurysms.

Surgical Implications:

The main thrust of the surgical treatment for a ventricular aneurysm should be to improve left ventricular function by resorting a normal filling volume and geometrical configuration of the chamber and eliminate the scarred, non contractile ventricular wall producing paradoxical motion during systole and ventricular overfilling during diastole. Other objectives are related to restoring circulation to the myocardium and in some patients may assume equal surgical importance.

**ANATOMY OF CORONARY CIRCULATION
AND BLOOD SUPPLY OF THE HEART**

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(HURST, 1982)**

I. THE LEFT CORONARY ARTERY:

In nearly all human hearts the left coronary artery arises from a single ostium located in the middle of the upper half of the left coronary sinus of the aorta which protrudes between the main pulmonary artery and the body of left atrium. There are virtually never any large branches of the main left coronary artery proximal to its division into anterior descending and circumflex rami.

Although the division of the main left coronary artery is usually referred to as bifurcation, three or more equally large divisions at this point are much more common. The large branch which courses down the anterior interventricular sulcus becomes the "left anterior descending artery" (LAD), the one which courses into the left atrioventricular sulcus becomes the "left circumflex artery". The intervening branches of the main left coronary distribute diagonally over the free wall of left ventricle are commonly referred to as "diagonal left ventricular branches" and they are one to three in number, and course between the anterior interventricular sulcus and the margo obtusus toward the apex of heart.

BRANCHES OF LEFT CORONARY ARTERY

i) Left anterior descending artery (LAD):

Viewed frontally, the LAD appears to be a direct continuation of the main left coronary artery, the two together forming a reverse S curve, the initial turn being around the base of the pulmonary artery into the anterior interventricular sulcus, and the second turn being around the apex cordis up into the posterior interventricular sulcus. The LAD gives off major branches in two directions:-

- a) Those which course over the free wall of left ventricle
- b) and those which penetrate and curve posteriorly into the ventricular septum.

Lesser branches are distributed to the adjacent wall of the right ventricle. At the level of the pulmonary valve a constant small artery. "The conus artery" curves about the pulmonary conus to meet a similar branch from the right side. Together these two form an important anatomic land mark known as the "circle of Vieussens".

The septal branches of LAD (numbering three to five

in different hearts) fix it to the epicardium and limit its limit of excursion during systolic filling. The branches to the free wall of left ventricle (numbering also three to five) course parallel to diagonal branches of the main left coronary artery. It is not generally appreciated that the anterior descending artery rarely terminates on the anterior surface of the apex, but nearly always curves around it to the posterior interventricular sulcus and ascends for 2 to 5 cm. distributing branches to the posterior surfaces of the apex of left and right ventricles. It is met at its termination by the distal branches of the posterior descending artery.

ii) Left circumflex artery:

The left circumflex artery typically arises at sharp angle of 90° or more and occasionally courses in an almost opposite direction from the main left coronary artery. The proximal portion of the left circumflex artery, as well as most of the area of bifurcation of the main left coronary artery, is normally covered by the overlying left atrial appendage. From its origin near the aorta and pulmonary artery, the left circumflex artery ascends into the left coronary sulcus and courses to the obtuse margin of the left ventricle. Just proximal to the margo obtusus it emerges from beneath

the lateral margin of the atrial appendage and is then covered only by epicardial fat. At the margo obtusus it usually turns down the left ventricle toward the apex of the heart. It always provides stout branches to the posterior (diaphragmatic) surface of the left ventricle from its course along the margo obtusus, including one or more fairly large branches which continue in the atrioventricular sulcus toward the posterior interventricular sulcus, where they are met by terminal branches of the right coronary artery. In about 10% of the human hearts the left circumflex artery itself continues in the posterior half of the left atrioventricular sulcus and crosses the crux of the heart, they run down into the posterior interventricular sulcus to form one or more posterior descending arteries; in such hearts the left coronary artery supply the entire left ventricle and interventricular septum. Branches of left circumflex artery supply most of the left atrium and the lateral wall and part of the posterior wall of the left ventricle.

- The two significant atrial branches are:

- . The one supplying the sinus node in about 45% of hearts.

- . The left atrial circumflex artery.

The left atrial circumflex artery usually

terminates on the posterior wall of left atrium, occasionally, it crosses back over the atrioventricular sulcus to supply the upper portion of the posterior left ventricle.

- The ventricular branches of the left circumflex artery arise at acute angles from the parent vessel and course toward the margo obtusus from the atrioventricular sulcus and are roughly parallel to the diagonal branches of the main left coronary artery and similar branches arising from the left anterior descending artery.

II. THE RIGHT CORONARY ARTERY:-

In approximately half of human hearts there are two ostia in the right coronary sinus, which normally bulges from the aorta in a direction between the base of the pulmonary trunk and the body of the right atrium. The smaller of these two ostia is rarely more than 1 or 2 mm from the larger, and is usually 1 mm or less in diameter. It gives rise to the conus artery, which forms the right half of the Vieussens's ring at the level of the pulmonary valves. When the conus artery does not arise from the aorta directly, it is the first branch of the main right coronary artery.

The right coronary artery courses from the aorta

into the right atrioventricular sulcus, lying more deeply in the fat of the sulcus than the left circumflex artery. In 90% of human hearts, it continue past the acute margine of the right ventricle into the posterior right atrioventricular sulcus to cross the crux of the heart and divide terminally in two directions:

- o Two or more branches descend in or near the posterior interventricular sulcus toward the apex of the heart,
- o Another stout branch continues into the left atrioventricular sulcus about halfway to the margo obtusus, with its descending branches supplying nearly half of the diaphragmatic surface of left ventricle (the other half usually supplied by terminal branches of the left circumfles).

Nearly all right ventricular branches of the right coronary artery arise perpendicular to the parent vessel, and those from the right atrioventricular sulcus to the anterior wall of the right ventricle have a looping exit as they emerge from their deep position in fat. The anterior right ventricular branches are three or four in number, the one courses along the margo acutus being the dominant of these, all these branches are roughly parallel to the acute margin of the heart coursing toward the apex and anterior interventricular sulucus.

In about 55% of the human hearts the right coronary artery provides the sinus node's arterial supply.

If the right coronary artery crossed the crux of the heart (90%), it predominate. If the left circumflex artery crossed the crux of the heart, it predominate. This classification does not refer to arterial supply of the entire heart. It would seem simpler and more accurate to say that the right or left coronary artery crosses the crux, or the right or left coronary artery is the longer, and to abandon the misleading term (predominate).

THE CORONARY VEINS:

There are 3 systems of veins in the human hearts:

i) The Thebesian Veins:

It is the smallest system and do not account for much volume of the venous drainage of the heart. They occur primarily in the right atrium and right ventricle but are occasionally demonstrable in the left side of the heart. In both sides of the heart they are more numerous near the septa than in the free wall.

ii) The anterior cardiac veins:

These are the intermediate system of veins which

are larger and more important, providing most of the venous drainage of the right ventricle. They form over the anterior wall of right ventricle into two or three large trunks draining in the direction of the anterior right atrioventricular sulcus, which they cross either deep or superficial to the main right coronary artery to empty directly into the right atrium.

iii) Coronary sinus and its tributaries :

Together they form the largest system of coronary veins, which drain the venous blood of left ventricle. Although there are equally large tributaries farther along its course, it is convenient to think of this system as originating with the anterior interventricular vein, which courses parallel to the left anterior descending artery in most of the anterior interventricular groove. Near the origin of the anterior descending artery, the anterior interventricular vein diverges toward the atrioventricular sulcus. At this point, it becomes known as the "great cardiac vein", receiving smaller tributary veins from the left ventricle.

About midway in the course of this vein within the left atrioventricular sulcus, it receives the cruing entrance of a small but very important left atrial vein